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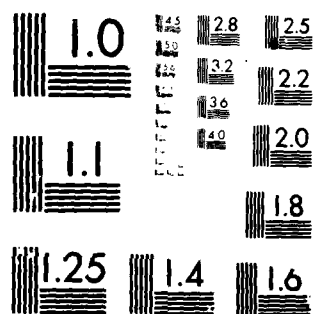
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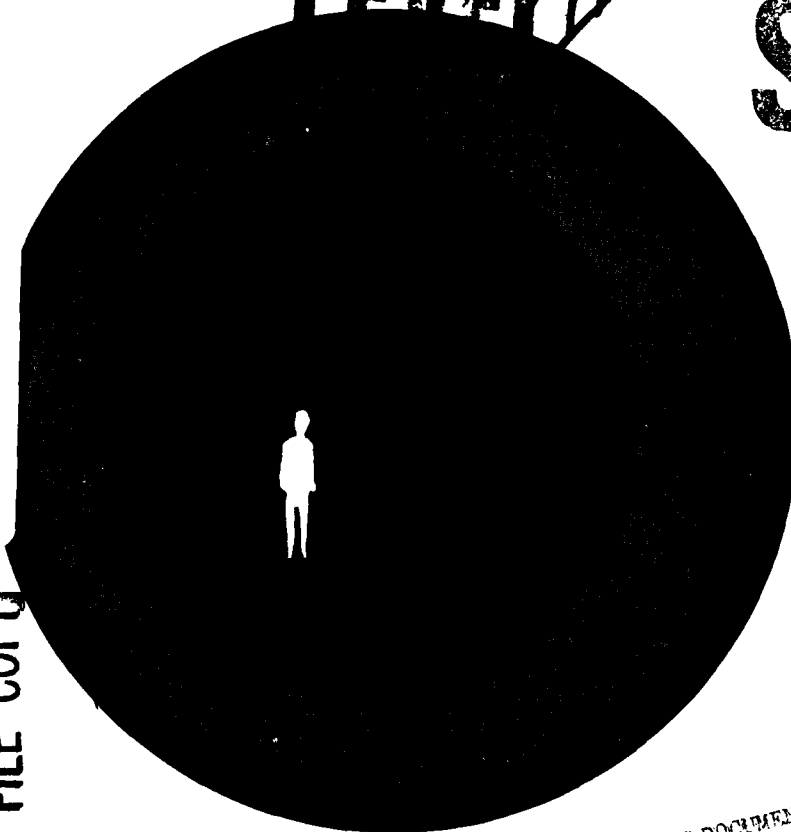
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TAE G REPORT
NO. 77

INCREMENTAL COSTING MODEL FOR USE
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DATA BASE: SYSTEM I

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INCREMENTAL COSTING MODEL FOR USE WITH THE CNET
PER CAPITA COURSE COSTING DATA BASE: SYSTEM I

William M. Swope
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Training Analysis and Evaluation Group

November 1979

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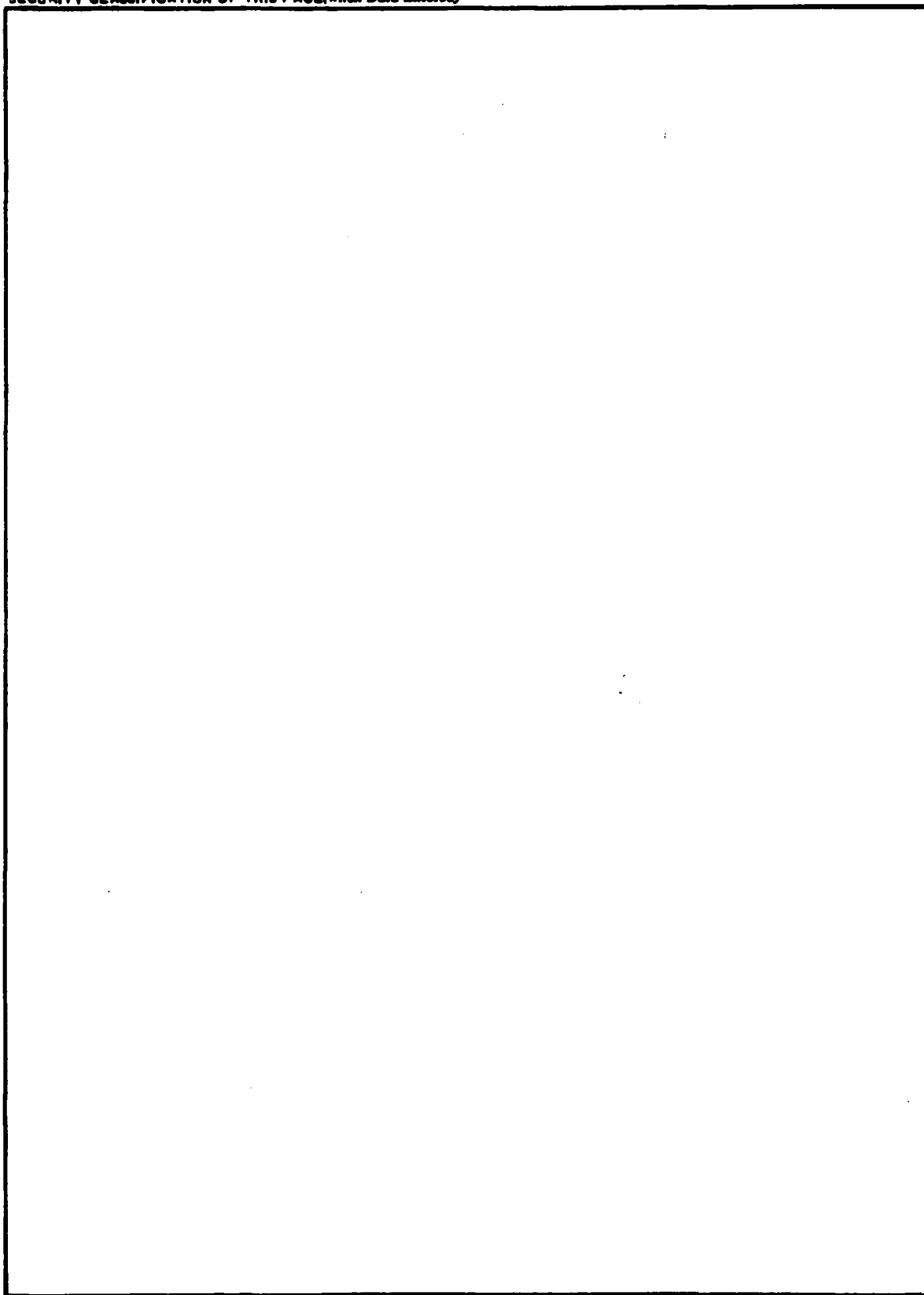
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SECTION I

INTRODUCTION

The proper method used for estimating training costs is dictated by the purpose for which the cost estimate is being prepared. It is for this reason that the unqualified question of "How much does it cost to train a Navy man?" is ambiguous. Those analysts charged with operational decisions affecting the budget will focus on how changes in the level of training will impact the budget. These decisions require marginal or incremental cost estimates. Individuals charged with the responsibility of planning for efficient training systems over longer periods will require average cost estimates.

Many existing data systems which track Navy training costs are not adequate for making incremental cost estimates. Consequently, managers often find that the kind of cost estimates required are simply not available in the form necessary for management. Existing course cost data are usually developed from time series data and the use of arbitrarily selected procedures for allocating joint costs among the items being costed.

Total training costs are usually computed by determining those resources which are uniquely related to training, including a depreciation charge for consumption of capital equipment and facilities, and then, by some process, making an allocation to training of costs which are incurred in joint activities, other than training. The per capita cost to train report, compiled within the Chief of Naval Education and Training (CNET) Command, uses a similar method in computing the per capita and course costing reports. Costs computed in this manner may be useful for responding to Congressional inquiries and for long-range planning, but their use for management and short-range operational decisions is limited.

All management options in the training command deal with either the addition (expansion) or reduction (elimination) of selected training activities. The execution of these management options is expected to occur within a very specific and well defined time period. Cost estimates which show how costs change when activities are expanded or eliminated within the specified time period are the relevant estimates for most short-run management decisions. Estimates derived in this way are the marginal or incremental costs.

STATEMENT OF THE PROBLEM

At present there are two cost data collection systems within CNET and neither are designed to provide estimates of the incremental costs of training. Because of the lack of an acceptable method for determining incremental costs, CNET tasked the Training Analysis and Evaluation Group (TAEG) to develop an incremental costing model adaptable to the data bases currently being maintained by CNET.

The first of the existing data bases is the Resource Management System (RMS). Data are collected and organized in this data system by administrative level, program element, function, and subfunction categories. This data system is designed and used for budget execution and control. A second

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data system is the Per Capita Cost to Train System. This system provides a capability for estimating the Per Capita Training Costs in each skill area/or course. Costs computed from the per capita system are the long-run average training costs. Neither of the existing data systems was designed to distinguish between the fixed and variable cost of training and, hence, do not have the capability to provide estimates of the incremental training costs per course.

Each year during the POM and budget development cycle, CNET is often required to provide estimates of the cost to train for each of several hundred courses. When the OPNAV sponsors are forced to make adjustments in their training budgets (and these adjustments are usually decrements) they must determine the amount of cost reductions which can be realized by the disestablishment or reduction of training in each course selected as a candidate for reduction. As the OPNAV sponsors select courses for reduction, CNET must respond with estimates of the potential savings which would result from these reductions.

The per capita cost to train model has been used with limited success but the average course costs computed with this model represent fully allocated fixed and variable costs. Because of the discrete nature of many training resources and the fact that many training resources are jointly involved with numerous courses, a flat projection of the fully allocated average total costs of training for each course cannot be used to make reliable estimates of the incremental costs. Usually, because of the fixed nature of resources, a flat projection of average total cost (ATC) will tend to overstate the short-run savings which can be realized for a given reduction in the training load.

PURPOSE OF STUDY

The objective of this study was to develop a model for estimating the marginal cost for each of the courses or course groups presently in the CNET Per Capita Cost to Train Data System. Specifically, the model provides the capability to:

1. determine the changes in costs which occur as the student average on-board changes
2. calculate cost changes which occur at the course, division, department and activity level
3. consider the time variable as it relates to the ratio of fixed to variable costs
4. allow for direct cost inputs for known or administratively dictated cost changes
5. estimate cost changes resulting from incrementing or decrementing the training load for courses, divisions, departments, and activities
6. consider training capacities when estimating cost changes which occur as a result of changing the training load

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7. be programmed on a minicomputer and integrated with the existing Per Capita Cost Data System so that it can be used to provide timely estimates of cost changes which result from postulated changes in course training levels.

SECTION II

APPROACH

THE MODEL

The model developed is an algorithm for determining the change in total costs resulting from a change in the work units (one man month of training) for a given course(s). The model is based upon the following relationships:

$$TC_i = TFC_i + TVC_i \quad (1)$$

$$ATC_i = AFC_i + AVC_i \quad (2)$$

$$AFC_i = TFC_i / WU_i \quad (3)$$

$$AVC_i = TVC_i / WU_i \quad (4)$$

Where:

TC = Total Costs
 TFC = Total Fixed Costs
 TVC = Total Variable Costs
 ATC = Average Total Costs
 AFC = Average Fixed Costs
 AVC = Average Variable Costs
 WU = Work Units (one man month of training)
 i = initial (or current) level of training

The total fixed costs in period i are determined by the following functional relationship:

$$TFC_i = f(\text{time, resource characteristics}). \quad (5)$$

Since fixed costs are by definition fixed for all output levels, the fixed costs at the revised output levels (r) can be given by:

$$TFC_r = TFC_i \quad (6)$$

and the average fixed costs at the revised output levels can be computed as

$$AFC_r = TFC_r / WU_r. \quad (7)$$

If all resources which are defined as variable can be expanded proportionally as output is increased then one can conclude that the ratio

$$f = \frac{TVC_i}{WU_i} = \frac{TVC_r}{WU_r} \quad (8)$$

will remain constant and therefore:

$$AVC_r = AVC_i. \quad (9)$$

In addition, the possibility exists that in some training units the proportionality assumption stated for equation (8) is invalid and a scale adjustment in AVC_r is necessary. Let

$$AVC'_r = f(AVC_r, (Scale)) \quad (10)$$

represent the average variable cost at the revised level of output adjusted for scale. The average total cost at the revised output level is then equal to

$$ATC_r = AFC_r + AVC'_r \quad (11)$$

However, we know that the estimate of ATC_r computed from data derived from the current training system may be biased if that system is not currently operating at design capacity. To remove that bias, the ATC estimates must be adjusted for these deviations. Therefore:

$$ATC'_r = f(ATC_r, (Capacity - Current Operating Level)) \quad (12)$$

The change in total costs can now be computed from the following function:

$$TC = ATC'_r \times (WU_r - WU_i) \quad (13)$$

A summary of the approach used in the application of this model is presented next:

- The total costs (TC) which exist at current levels are separated into fixed and variable costs.
- The average fixed costs (AFC) at specified revised output levels are computed by dividing the total fixed costs by the revised output level.
- The average variable costs (AVC) at the revised output levels are computed by dividing the total variable costs by the present output levels.
- If the total variable costs (TVC) change in direct proportion to output levels then it can be assumed that the average variable costs would remain unchanged as output is increased. The AVC at the revised output level is then set equal to the AVC at the initial level. This proportionality assumption is later relaxed as adjustments are made in this initial computation.
- The average total costs (ATC) for the revised output level are computed by summing the computed AFC and AVC. A typical set of average cost curves is illustrated in figure 1.

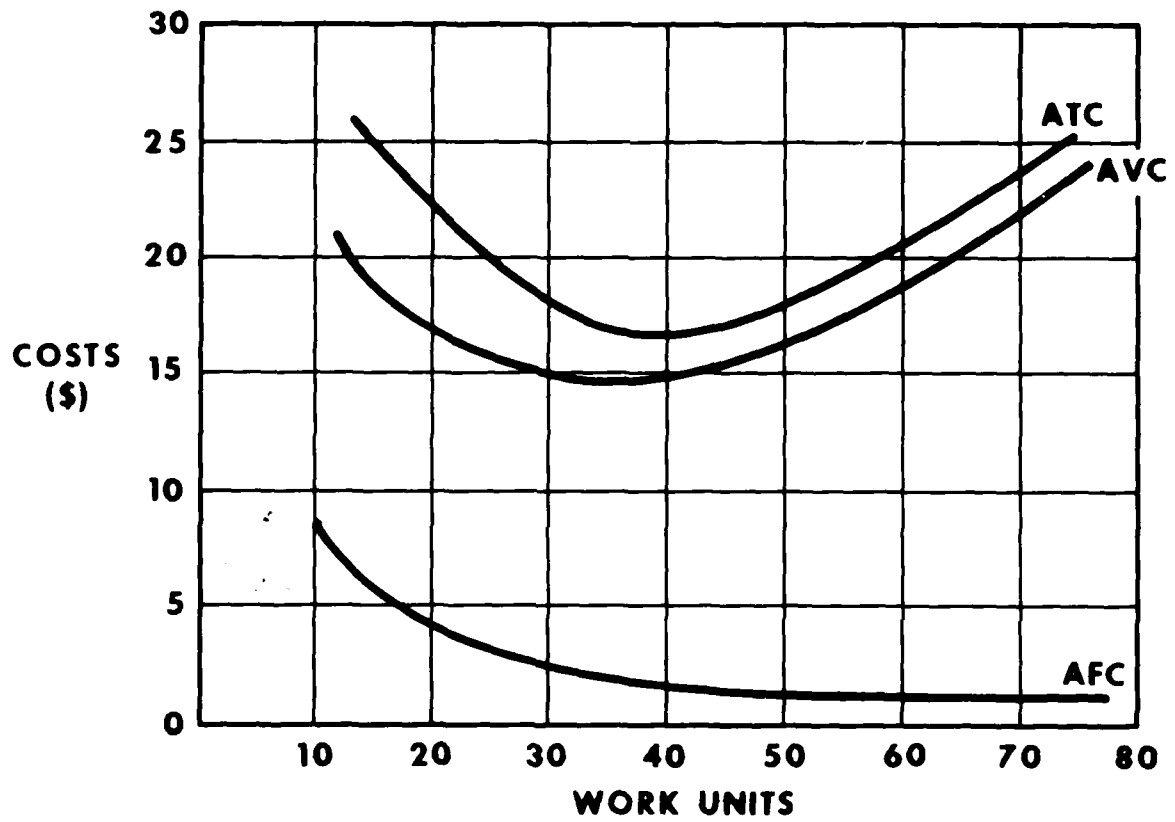


Figure 1 Typical Average Cost Functions

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Capacity adjustments are made in the ATC for all resources and functions which are not operating at design capacity as determined from current Navy Integrated Training Resources and Administrative System (NITRAS) data.

The model provides provisions for scale adjustments in the ATC function computed above. The latter adjustments are based upon the assumption that the long-run ATC for large training organizations may be lower than for smaller and potentially less efficient training organizations. This assumption must be statistically tested for each data element and, when found significant, a set of linear regression equations must be developed to estimate the scale effect. The model also provides provisions for applying an exogenous determined inflation factor to the estimated revised costs. An option is also provided to override any cost estimate developed by the model. The latter option would normally be exercised when it is known, by administrative edict, that changes in resource use are to be determined outside the model. These known and given costs can be used to replace the values estimated by the model. The RMS Per Capita Cost Data base and NITRAS data base were used in the development of the model. Productivity measures of the training systems were in terms of the amount of training provided as measured by work units. A work unit is defined as one man month of training.

The remaining sections in this part of the report will discuss in detail the data base and procedures used in developing the incremental cost estimates.

DATA BASE

The model is designed to utilize the data collected in the Per Capita Cost to Train Data System which is currently maintained by the Resource Analysis Division of CNET. This data system was designed and is maintained for the purpose of collecting activity training cost data and for preparation of the per capita cost of training report and the training course cost report. This incremental costing model is uniquely designed to interface with and to be made an integral part of that data system.

The per capita cost data are collected and updated annually in accordance with instructions promulgated by the CNET. Costs are collected at the course level and three higher administrative levels. Costs assigned to each administrative level are not double counted and are, therefore, mutually exclusive among the administrative levels. Costs for all administrative levels below any one in question can be added to obtain the total cost for the level in question (i.e., costs can be added at the course level to obtain division costs, division costs can be added to obtain department costs, and department costs can be added to obtain activity costs).

The lowest level of costing is at the course level. All costs which can be uniquely related to that course are assigned directly to that course. If the resources, from which the costs arise, serve more than one course, then the costs are assigned to the next higher administrative level (which is the division). Thus, there is no allocation of the joint administrative costs to the courses they serve. Similarly, the costs which are uniquely related to

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the division are assigned to the division but if resources are serving more than one division then the cost of these resources are assigned to the department level. Again, there is no allocation of the joint or overhead costs.

The activity is the highest administrative level for which costs are aggregated. Costs are identified in the data base using a five alpha cost account structure. The first digit is the numeral 5. The second position is an alpha character which identifies a department. The third position is an alpha character which identifies the division and the final or fourth position identifies a course and/or course group (figure 2). Therefore, the five-alpha cost account structure uniquely identifies each of four data sets in the data base. The four sets are: (1) the direct activity costs, (2) the direct department costs, (3) the direct division costs, and (4) the direct course costs. Each data set is composed of elements which identify the resource class and function performed. There are seven resource classes and 18 functions in each data set. The matrix for each data set is shown in table 1. Forty-one of the possible 126 cells in this matrix may have nonzero values. Those cells which may contain positive entries are numbered and identified in the appropriate cell of table 1. The data in each of the four data sets are mutually exclusive and therefore additive.

Total activity costs including all organizational units and courses under the activity are given by:

$$TA = \sum_{i=1}^{41} \sum_{j=1}^{jj} A_{ij} + \sum_{k=1}^{kk} P_{ik} + \sum_{n=1}^{nn} D_{in} + \sum_{t=1}^{tt} C_{it}$$

Where:

A_{ij} = The i^{th} direct cost element of activity j

$j = 1, jj$; where jj = number of activities

$i = 1, 2, 3, \dots, 41$

P_{ik} = The i^{th} direct cost element for department k

$k = 1, kk$; where kk = number of departments

$i = 1, 2, 3, \dots, 41$

D_{in} = The i^{th} direct cost element for division n

$n = 1, nn$; where nn equals the number of divisions

$i = 1, 2, 3, \dots, 41$

5 ALPHA COST ACCOUNT STRUCTURE

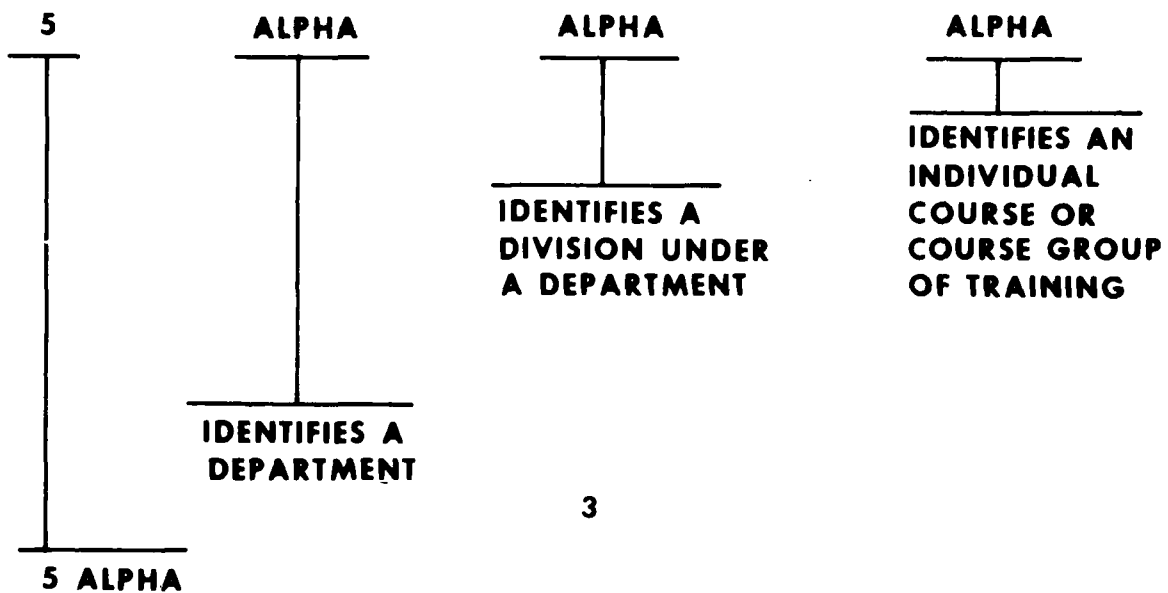


Figure 2. Course Cost Account Structure

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TABLE 1. MATRIX OF DATA ELEMENTS IN EACH DATA SET
FOR CNET COST DATA BASE*

FUNCTIONS	RESOURCE CLASS						
	M.HR	C.HR	M.LB	C.LB	SUPP	CONT	MISC
DIRECT	1	2	3	4	5	6	7
AC-FC-SP	8	9	10	11	12	13	14
HOST-ACT			15				16
OT-ACT			17				18
TR-EQ-MT							19
MJ-PJT							20
ADP			21				22
CNETS			23				24
FN-CMD			25	26	27	28	29
STF-PCS			30				
STF-BMD			31				32
STF-F.H.							33
EQ-DEP							34
BLD-DEP							35
STU-BMD			36				37
STU-F.H.							38
STU-TVL			39				40
STU-SAL			41				

*See appendix C for definition of labels. The labels used in the table are consistent with those used in the computer model discussed subsequently in the report.

C_{it} = The i^{th} direct cost element for course t
 $t = 1, 2, \dots, tt$; where tt equals the number of courses
 $i = 1, 2, 3, \dots, 41$.

There are approximately 4,000 Navy courses included in the cost data base. The costs are collected on an individual course basis for approximately 1,500 of the 4,000 courses. The remaining courses are grouped on the basis of varying criteria which include the location where the courses are taught, the administrative control and organization over the courses, characteristics of the courses, and the degree to which the support for the course is provided by resources serving other courses or functions. The costs for courses are usually grouped when there is no clear and unambiguous method for separating the joint costs.

Courses which are grouped in the Per Capita Cost to Train System required a special procedure in the model for estimating the direct course costs. For those courses, the costs were estimated by taking a straight proration of the cost elements for the group based on the number of work units. The model, therefore, requires the user to input the current work units for each grouped course, the course length, and the number of graduates which correspond to the cost data base. It was assumed that the attrition rate for the course was the same as for the course group and that the average weeks attended per attritee was the same for the course as for the group which included the course. Using these data, the total attrition weeks and estimated enrollment were computed for each of the grouped courses.

Data drawn from the NITRAS include equipment, facilities, and personnel training capacities; class convenings; course lengths; and other statistical data on course and class characteristics. In summary, the cost data from the Per Capita Cost to Train Data System and the course data from NITRAS constitute the data base used for the incremental costing model being developed in this modeling effort.

PRODUCTIVITY MEASURES

The basic measure of productivity used in the model is the "work unit" which is defined as one man month of training. The work units of training are determined by tabulating the daily average-on-board for each training day in the month and dividing this sum by the number of work days in the month. The costs are compiled for each of the four organizational levels; however, the work units are compiled only at the course level. The division work units are obtained by adding the work units for all courses in the division; the department work units are obtained by adding all courses (or divisions) in the department; and, finally, the activity work units are obtained by summing the work units for all courses (or departments) in the activity. An illustration of the distribution of work units among the courses, divisions, departments, and for the activity is shown in figure 3.

This model uses the number of training months (or work units) as the measure of productivity. The model does not attempt to measure, or even

UNIT IDENTIFICATION	COST ACCOUNT	WORK UNITS		
		ACTIVITY	DEPARTMENT	DIVISION
12345	N/A	367		
	5AAA		116	
	5ABA			100
	5ABB			
	5ABC			
	5ABD			
	5ADA			16
	5ADB			
	5ADC			
	5BAA		251	
	5BBA			251
	5BBC			
				251
				7
				66
				27
				6
				10

Figure 3. Illustration of Work Unit Distribution in Each of the Four Data Sets

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address, the variations in the effectiveness of training which might occur as the level of resource commitment to each course is varied in response to budget adjustments. This implied assumption of constant training effectiveness may be tenable for relatively minor long-run changes in resources devoted to the course but less tenable when those adjustments are large and must be made within a relatively short time span. For example, if managers of a course are forced to accommodate a large influx of students then those managers may choose to both increase the class size and meeting frequency. This will undoubtedly require instructors to work longer hours and decrease the instructor-to-student ratio. One would expect the efficiency and effectiveness to drop. Responsibility for evaluating these and similar qualitative changes in training effectiveness is left to the model user.

The changes postulated for each course are measured in terms of changes in work units and cost changes are then estimated for each work unit change. Alternatively, the user can choose to input into the model the course enrollments or the number of graduates for the course. When enrollments (or graduates) are input, the model will first compute the revised work units and use the computed revised work units as the basis for estimating the cost changes.

The total training days are computed by summing the days required for each graduate, the days lost for attrition, and the days required for students setback. The following function is used for computing the training days:

$$\text{Training Days} = 7 (X_2 X_4 + .5 X_1 X_3 X_4 + X_2 X_4 X_5 X_6)$$

$$\text{Work Units} = \text{Training Days} \div 30$$

Where:

- X_1 = Enrollments (Number)
- X_2 = Graduates (Number)
- X_3 = Attrition Rate (Percentage of Enrollments)
- X_4 = Course Length (Weeks)
- X_5 = Setback Rate (Percentage of Graduates)
- X_6 = Proportion of Course Repeated

FIXED VS. VARIABLE COSTS

The fixed costs are defined as those costs which cannot be changed within the period of time allowed for implementing the management decision. Therefore, when the manager specifies the time period within which any postulated management option is to be exercised, the ratio of fixed to variable costs is exogenously determined. Although resource characteristics determine the manageability of resources, it is incorrect to divide resources into fixed and variable classes on the basis of resource characteristics alone. Any division must be responsive to the time period allowed to implement the change.

The primary objective of this model is to determine the incremental (or decremental) costs associated with changes in work units. To meet this objective, it is necessary to determine the fixed and variable resources for each postulated change in work units. Since it is a prerogative of management and planners to choose alternative planning periods, the procedure developed for separating the fixed and variable costs is responsive to the length of the planning period.

It was assumed that the resources for each data element (within each data set) were relatively homogenous and equally manageable within a given time period. A typical function used to determine the proportion of fixed and variable costs for each data element is illustrated in figure 4. Point "A" represents the number of months in which the resources of the given data element are totally fixed. Point "B" represents the number of months in which the resources of the given data element are totally variable. For any planning period shorter than the months indicated by point "A," all resources will be fixed; for any period which exceeds the months indicated by point "B" all resources will be variable. The proportion of costs which are fixed between points "A" and "B" is determined from the linear relationship as illustrated in figure 4.

The model requires the user to input, for each data element, the months corresponding to points "A" and "B." Using these data points, a fixed-variable distribution function similar to the one illustrated in figure 4 is developed for each data element and used as the basis for separating the fixed and variable costs.

PARTIAL OR WHOLE BILLETS

The model provides the option for the user to select computational routines which compute the total labor costs based upon either partial or whole billets. It was assumed that for selected situations it might be more appropriate to increase or decrease military or civilian labor in integer billet units. When the partial billet option is selected, the total labor costs are simply computed by multiplying the adjusted ATC for each cell by the appropriate level of work units. However, when the whole billet option is selected then the estimated total cost at the revised level of output is divided by the average pay rate and rounded to the nearest whole number of billets. An estimate of revised total costs is then recomputed by multiplying the integer number of the revised billets by the average pay rates.

The average annual pay rate for both civilian and military labor can be

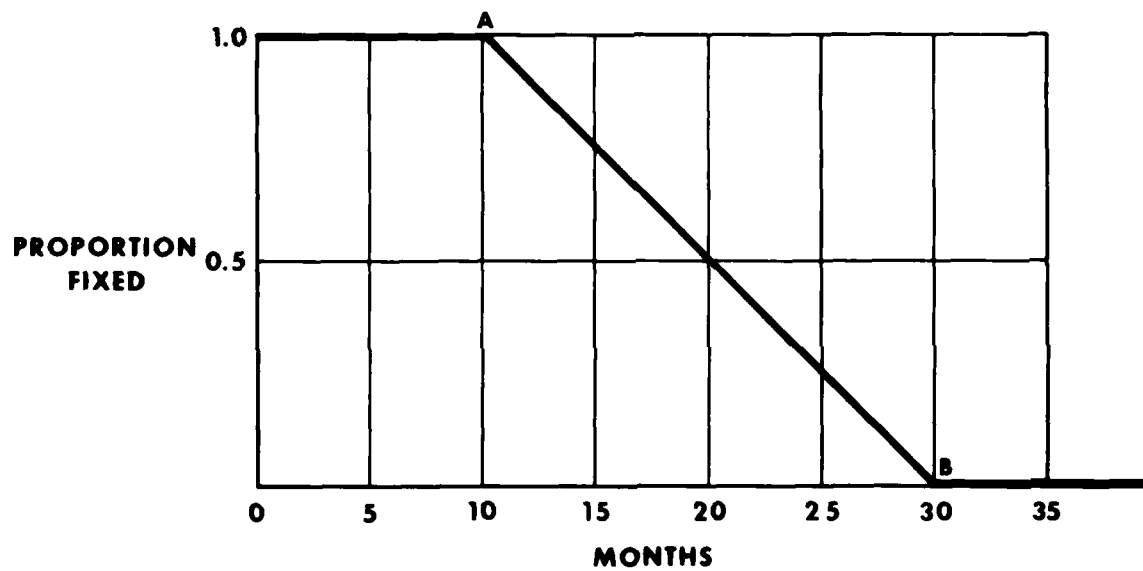


Figure 4. Hypothetical Fixed-Variable Cost Distribution Function

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input as data into the model, or alternatively, a pay rate can be computed from the existing data base. When using the existing data base, the total labor costs are divided by hours to obtain an hourly rate. The annual rate is then computed on the basis of 2,080 hours per year.

ADJUSTMENTS IN AVERAGE COSTS

CAPACITY ADJUSTMENTS. The average total costs which are computed at present operational levels may be biased, depending on whether or not the current training load is equal to the training capacity of resources presently available. It is assumed that for those training systems which are operating at less than the design or manning capacity, the training load could be increased up to capacity without any increase in total costs. Consequently, as the training load is increased up to the capacity levels, the ATC will decrease for those data elements with surplus capacity.

It was further assumed that for those training systems in which the present work load exceeds the design capacity that the total costs will not change as the work load is reduced to design capacity. The adjustments which take place will be a reduction in the intensity of use of existing resources. If the total costs remain unchanged as work units are decreased toward capacity levels, then the ATC will increase.

Personnel, equipment, and space capacity measures are collected for each course reported in NITRAS. The personnel capacity variable states the maximum "number of students that may be trained per class based on the number of instructors and non-instructor billets contained in the manpower authorization and used locally to support the course. The number assumes that unlimited space and equipment are available."¹ The equipment capacity is "the number of students that may be trained per class based upon the amount of equipment available per scheduled class period. The number entered assumed that unlimited personnel and space are available."² The space capacity constraint is "the number of students that may be trained per class based on the availability of classroom space for a specific class. Classroom/training space includes laboratory, shop, hangar, or any other space configured for training purposes. The number entered assumes that unlimited personnel and equipment are available."³ By using the class length, number of convenings per year, and class capacity, the maximum number of annual work units was computed for each course.

¹ Navy Integrated Training Resources and Administrative System (NITRAS) Reports Manual, CNET P1510/2. 26 July 1976, Chief of Naval Education and Training, Pensacola, FL.

² Ibid.

³ Ibid.

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The direct military and civilian labor costs incurred at the course levels are the only data elements for which the personnel constraints are applicable. The data element identified as miscellaneous costs attributed to equipment depreciation (only at course level) is the only data element for which the equipment capacity constraint is relevant. Since the equipment costs represent only the depreciation costs, any equipment capacity adjustments will be of a long-run nature and it cannot be inferred that the resultant estimate will be a realistic estimate of the change in current costs which might be incurred by adjusting the training loads. When large equipment purchases or reductions are necessary, it is more accurate in the short run to make the cost estimates outside the model and provide these estimates as direct inputs to the model solution. A similar caveat is applicable for facilities depreciation. Construction costs, rather than depreciation rates, would provide the proper estimates for flow of funds budgeting.

The capacity adjustment is not made on courses contained within a group cost code. The adjustment on group courses was not possible because of deficiencies in the data base; namely, there is no reliable way to determine the current operating capacity and/or costs for one individual course when the costs and other data for that course are included in a course group.

When the reduction in training loads is projected to drop to relatively low levels and the time period for implementing these reductions is relatively short, then the manageability for most resources may be so restricted that those resources already in place (i.e., the fixed resources) may be more than necessary to meet the reduced training loads. The maximum number of work units which could be accommodated with the fixed resources was computed by dividing the total fixed costs by the estimate of the long-run average total costs. If the projected level of work units was less than this maximum computed number then the average total cost was recomputed by dividing the fixed costs by the projected level of work units. This would result in higher short-run average total costs because of the inflexibility of the resource base in the very short run.

SCALE ADJUSTMENTS. The average total costs for courses with large throughputs may be lower than courses with relatively small throughputs. Certain costs remain relatively constant over wide ranges of output. In addition, larger training systems have greater opportunity to utilize more sophisticated training technology and this may have a tendency to reduce the average training costs. The model does not assume any scale economies or diseconomies but does provide the user with the means to make the scale adjustments if it is determined that such adjustments are significant. The model is currently programmed to use the parameters from a multiple regression prediction model with a maximum of two independent variables. The structure of the prediction equation can be easily changed in the model.

When it is determined (from analysis exogenous to the model) that significant scale effects are present for any particular set of data elements, then the user must determine the structural form of the equation which can be used to predict these scale effects. If the prediction equation can be represented with a linear multiple regression function with a maximum of two independent variables, then the user can simply use the costing model by inputting the coefficients of the linear regression model. If, however,

the prediction function is not of a linear form, then the user must modify the model by putting in the appropriate equations and coefficients.

Scale effects can only be captured in the long run as the training unit has time to adjust its resource base and as resources become variable or manageable. Consequently, the scale adjustments are made only on the average variable cost component of average total cost. The procedure for making the scale adjustments is as follows. Using the prediction equation, an estimate of the total cost is made for both the present work units and projected work units. The change between the two estimates is computed by subtracting the revised total cost estimate from the current total cost estimate. The percentage change between the two estimates is computed using an average of the two estimates as the base. This percentage, plus one, is multiplied by the average variable costs of the current work units to obtain an estimate of the change in the average variable cost.

The scale adjustment procedure can be illustrated using figure 5. Assume that the prediction equation $Y = A + BX$ has been derived by computing a simple regression function of work units on average costs from historical data. The points "A," "B," "C," and "D" represent the AVC for work units indicated on the horizontal axis. If "A" represents the current AVC, the requirement is to determine an estimate of the AVC for point "B." The prediction equation is used to make an estimate of the AVC for the current work units (10) and this estimate is represented by point "C." Similarly, an estimate of the AVC for the revised work units (20) is computed and this estimate is illustrated by point "D." The proportional change in AVC between "C" and "D" is $P = (C - D) / ((C + D) / 2)$. It was assumed that current AVC (illustrated by point "A") would change in the same proportion as indicated by the prediction equation. Therefore, the estimated AVC at point "B" was estimated as the AVC at point "A" times the percentage change (P).

The model solution is constrained to insure that total costs and work units move in the same direction. It is conceptually untenable that when work units decrease total costs should rise and vice versa. In order to circumvent this potential difficulty, an elasticity coefficient was computed by dividing the percentage change in work units by the percentage change in average total costs as estimated by the prediction equation. When the result is found to be elastic (or has unitary elasticity), the computation of the revised AVC is based on the assumption that the percentage change in the actual AVC is equal to the percentage change in the AVC as estimated from the prediction equation. The revised AVC is then computed by multiplying the present AVC by one plus the percentage change in AVC as determined from the prediction equation.

When the absolute value of the elasticity coefficient is less than one, then total cost would be inversely related to work units. Such a result is untenable, and the inverse relationship results from faulty data or an inaccurate structure of the prediction equation. When this contingency occurs, the scale adjustment is omitted and the user is warned of the decision not to adjust for scale. A more detailed description of the computation of the elasticity coefficient is presented in appendix A.

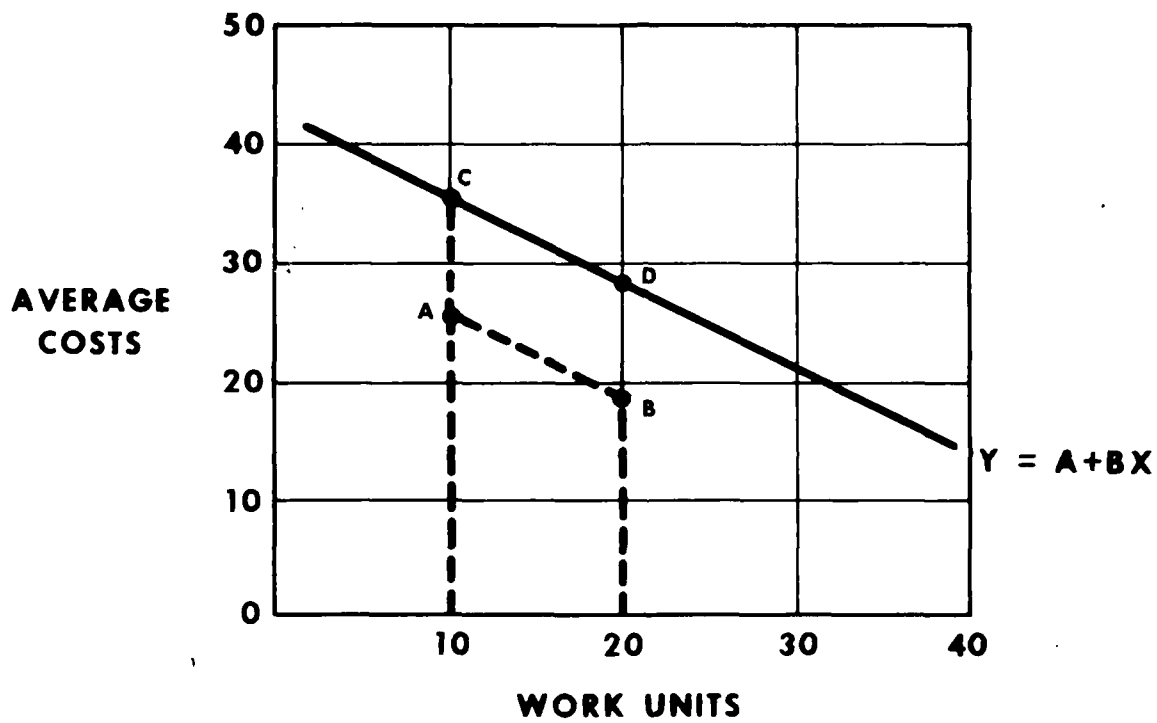


Figure 5. Scale Adjustment of Average Costs

INFLATION ADJUSTMENTS. The incremental (or decremental) cost estimates derived from the model can be adjusted for inflationary increases over the planning period. Two inflationary rates, one for MPN funds and one for O&MN funds, are used in inflating the data for the base year estimates. The model does not assume an inflation rate and when inflationary adjustments are desired, the option must be selected and an inflation rate provided. The inflationary adjustment factor is compounded monthly over the planning period.

The existing data base can be updated to any month or year the user wishes to consider as the base period for analysis. The existing data base is assumed to be current in the ninth month of the fiscal year to which it applies. The planning period extends the analysis from the base year selected by the user. For example, assume the existing data base is for 1978 and the user wishes to implement a management option beginning in the year 1980. First, the existing data base would be updated to 1980 as the base year for analysis then, given a planning period of 12 months, one will obtain an estimate of the change in total costs for the following 12 month period. If the planning period is extended to 24 months, then the change in total annual costs for the second year will be computed.

The user should note that because of the inflation adjustment of the incremental costs, it is possible the absolute costs could actually increase from the last period with a reduction in the work units of any given course. This would most likely occur when the inflation adjustment was large and the reduction in work units relatively minor.

A complete documentation of the computer model is included in appendix B. This documentation includes a system flow chart, file specification formats, program flow charts, variable definitions, a program listing, and a sample of the output for a hypothetical problem.

SECTION III

MODEL OPTIONS

The following options are available in the model:

PLANNING PERIOD

The user has the option of specifying the time period over which management changes are to be implemented. Management flexibility is determined by the length of the planning period. The shorter the planning period, the less flexibility and the greater the proportion of resources which must be considered fixed. The percentage of total resources which are fixed is determined by the planning period and a functional relationship is constructed for each data element. The planning period is specified in months and any period of time is acceptable as model inputs.

BASE YEAR

The user can specify any year as the base year for analysis. If a year other than the year of the data base is specified, then the data base will be inflated to the base year selected for analysis. This option allows the user to calculate cost changes which will result from management decisions scheduled to be implemented at some future year in the FYDP. It is a measure of how costs are expected to change following the implementation of the management option. The planning period begins from the base year selected for analysis.

TRAINING REQUIREMENT SPECIFICATIONS

The model is constructed to receive one of three measures of productivity. The first measure of training requirements can be specified in terms of work units (defined as one man month of training). When work units are used as the productivity measures, then the changes in training loads can arise from changes in any one of a number of contributing variables. The number of graduates, course length, attrition rates, setback rates, and setback proportions are all variables determining the work units. Thus, a reduction in work units does not necessarily mean that the number of graduates must be reduced. Although the reduction of graduates is the most significant factor in reducing work units, a reduction in attrition rates, setback rates, course length, and setback proportion will also contribute to a reduction in work units. If work units are specified, then the model computes the number of graduates and enrollments consistent with the existing or specified attrition rates and setback rates.

The second measure of training requirements allows the user to specify the annual number of graduates which must be trained. When graduates are specified, the model computes the number of enrollments and work units using specified or existing attrition rates, setback rates, and course lengths. The third measure of training requirements which can be used is the annual enrollments to each course. When enrollments are input, the model computes work units and graduates using existing or specified attrition rates, course

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length, and setback rates. Only one of the three productivity measures can be used since more than one measure would be redundant with the fixed model parameters.

PAY RATES

Military and civilian pay rates can be input into the model or the model default can be selected. The pay rates computed by the model are obtained by dividing the appropriate total costs by total hours to obtain an average pay per hour. The annual rate is computed by multiplying the hourly rate by 2,080 hours.

DATA BASE CHANGES

Prior to the execution of the model, the user has the option of selecting any cell in each of the data sets and making a temporary change or correction of the data in that cell. These changes are not automatically made on the permanent data files. However, the user has the option of saving on permanent files the entire revised data base for future reference. This option can be used to input administrative dictated changes or to correct or update the existing data base.

SOLUTION MODIFICATION

Following execution of the model, the user is offered the option of selecting any data cell in each of the data sets for modification or change. This option is exercised prior to calculating and printing the summation data on total cost changes. This option provides the capability to override the model results and input into the solution any cost impacts resulting from exogenously determined administrative edicts.

INFLATION

An inflation option can be selected which will update the solution and/or data base to any specified year as indicated by the number of months in the planning period. The option is available to specify an inflation rate for all MPN funds and one rate for all O&MN funds. Each data element in each of the four data sets is uniquely related to a specific type of fund and the model is constructed to apply the appropriate inflation rate to each of the cells. Equipment and building depreciation estimates are not inflated since those funds are usually MILCON or OPN funds. If the year selected as the base year for analysis is different from the data base year then the data will be updated to the base year selected for analysis. Therefore, inflation rates must be provided when the base year selected for analysis differs from the data base year.

ATTRITION RATE

The current attrition rate is computed by taking the number of attrites as a percentage of the total enrollments. The attrition rate computed by the model can be replaced by a specified attrition rate determined by the user.

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SETBACK RATE

The setback rate used in the model is that rate reported for each course by NITRAS. This rate can be replaced by a user determined setback rate.

SETBACK PROPORTION

This represents the average proportion of the course repeated by the typical setback student. The default value is 10 percent but the user has the option of selecting any other value.

DIAGNOSTICS

Following execution of the model the user may select a diagnostic option which will provide information for selected variables used in the computation of the final results. The exercise of this option would normally be used in evaluating and justifying results of the model which exceed limits expected by the user. It could be used to aid in the identification of erroneous input data.

SECTION IV

SUMMARY

This model was developed under the philosophy that the commonly stated requirement that all costs must be allocated to each output unit is an unnecessary requirement to obtain useful management information. Many cost models estimate costs for each new output level and then compute the change in costs as a residual between the original costs and the revised cost estimates. The procedure followed in this model first estimates the change in costs and then the revised costs are estimated by adding the change in costs to the original costs. This approach has avoided the cumbersome and usually arbitrary procedures for allocating joint or overhead costs down to each production unit.

The data provided by the output of this model on incremental cost changes are sufficient to answer the question of how training costs will be affected for given changes in the training load for each of the 4,000 courses in the per capita data base. The output of this model can be used as the basis for determining optimal changes in the existing configuration of training systems which become necessary because of changes in resource availability. The optimality criteria can vary but it will require a determination of the cost impacts associated with adjustments in the training loads. This model provides an estimate of these cost impacts.

The incremental cost estimates obtained from this model are considered the proper estimates necessary to maintain an efficient training system. Also, the incremental cost estimates from the model can be used to determine the adjustments in charges which must be made to the various sponsors of the training courses.

Results from this model cannot be used to estimate the total charges but only how existing charges are to be adjusted in response to the adjustment in the training load. The full allocation of all costs to each course may be necessary in order to allocate the total training budget to the various warfare sponsors, especially when no previous basis exists for considering only the changes. In order to fulfill this requirement for fully allocated costs and to provide an ad hoc method for estimating the marginal costs of direct and overhead costs for each course, the model developed and reported here will be extended and modified in further developmental work.

APPENDIX A

SCALE ADJUSTMENTS

The scale adjustments in current AVC were based on the assumption that the percentage change in AVC would be equal to the percentage change in AVC as predicted by a linear regression model. Therefore let:

W_1 = Work units at current level

W_2 = Work units at revised level

X = AVC for current level at W_1

X_1 = Estimated AVC at W_2

Y = Estimate of ATC at W_1 from linear regression model

Y_1 = Estimate of ATC at W_2 from linear regression model

$A = (Y - Y_1) / ((Y + Y_1) / 2)$ = Percentage change in linear regression estimate of ATC

$B = (W_1 - W_2) / ((W_1 + W_2) / 2)$ = Percentage change in work units

An elasticity coefficient (E) was computed as follows:

$$E = \frac{B}{A}$$

When $|E| \geq 1$ then total costs increase as work units increase and vice versa. Therefore, it was assumed that the

$$\% \Delta X = \% \Delta Y$$

Therefore:

$$\frac{X - X_1}{(X + X_1) / 2} = A$$

$$X - X_1 = \frac{1}{2} A (X + X_1)$$

$$X(2 - A) = X_1(2 + A)$$

$$X_1 = X \frac{(2 - A)}{(2 + A)}$$

However, when $|E| < 1$ then total costs increase as work units go down and vice versa. When this contingency occurs it is conceptually untenable and a modification of the above assumption is necessary.

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When $|E| < 1$, it is assumed that the data are faulty and/or the scale prediction function is incorrectly structured, and the scale adjustment is omitted.

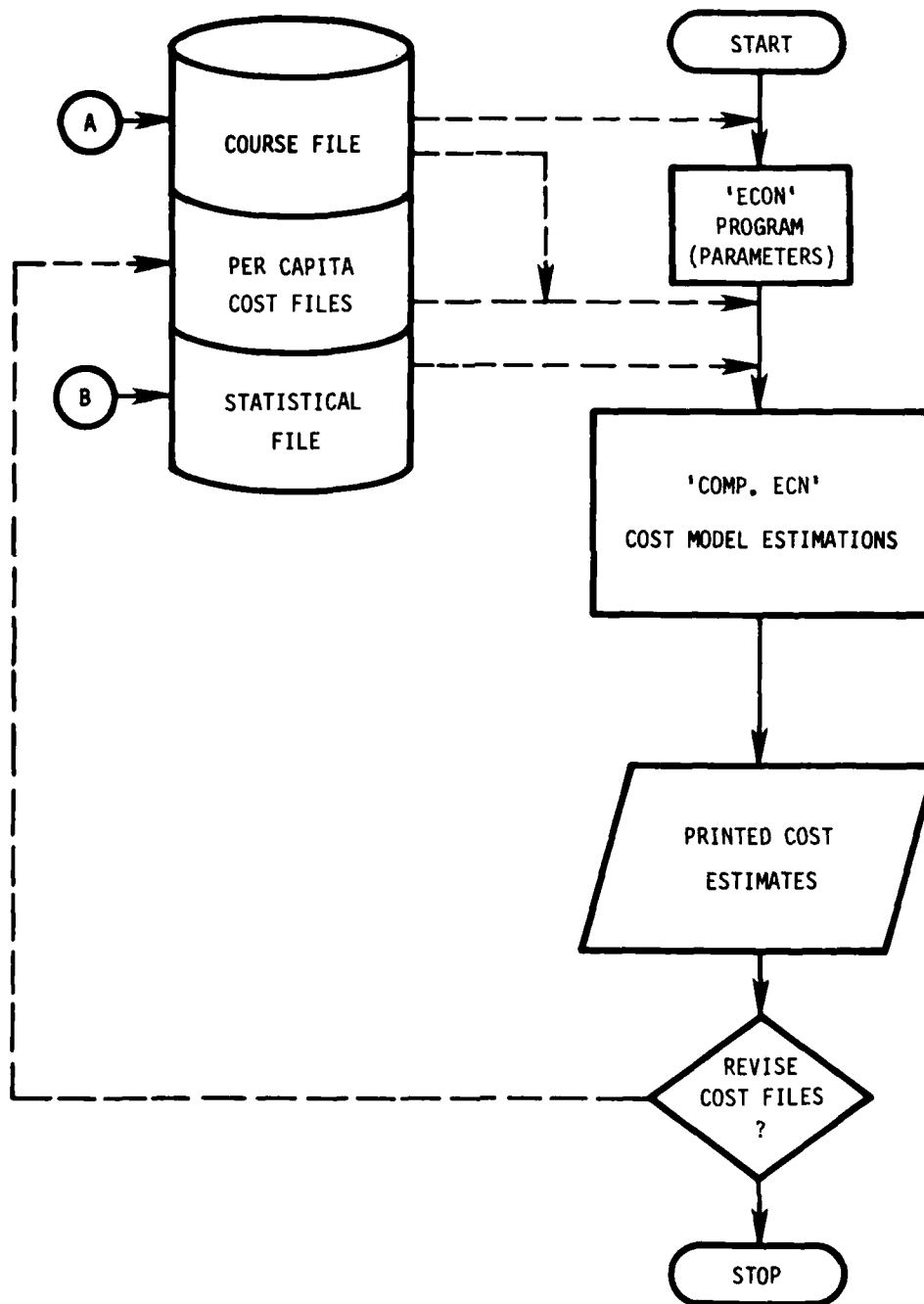
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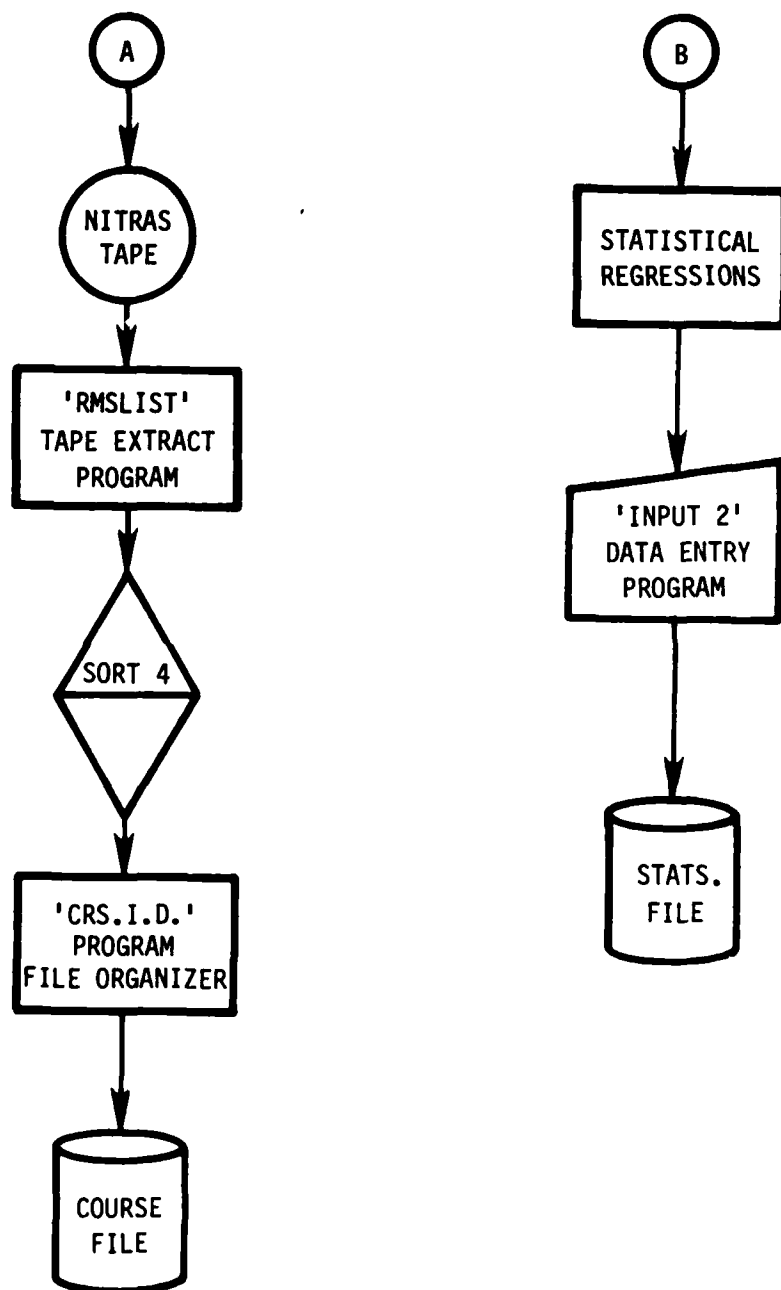
APPENDIX B

THE COMPUTER MODEL

The following items are included in this appendix: (a) The Cost Model System Flow Chart, (b) File Format Specifications, (c) Program Flow Chart, (d) Program Listing, (e) Variable Definitions, (f) Statement Definitions, and (g) Sample Output.

COST MODEL - SYSTEM FLOW CHART
SYSTEM I





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FILE FORMAT SPECIFICATIONS

COURSE FILE FORMAT SPECIFICATIONS

User File:

File Name. CRS.F101
 Approx. number of records. 4000
 Password (none)
 KFAM blocking type A
 Blocking factor. 2
 Logical record length. 124 + 1 sov = 125

Key Files:

Number of key files. 2
 Key File 1:
 Key name. Course ID number
 (UIC RMS 00)
 Position. *prp(6,11), **lrp(4,11)
 Key File 2:
 Key name. CDP number
 Position. prp(17,4),lrp(15,4)

Description:

This file contains NITRAS Course descriptive data taken from the MICRF Extract Tape, to be used by the cost model program "COMP.ECN".

Sample Programming:

Declaration:

DIM A\$(2)124
 DATA LOAD DC #1, A\$()

Record Description:

REC Pos	STR Pos	Dimension of Field	Bytes Packed	Description of Data Item	Comments
1	1,3	3	----	Blank Field	
2	4,5	5	----	UIC number	
3	9,4	4	----	RMS number	
4	13,2	4	2	Course number	(within group)
5	15,4	4	----	CDP number	
6	19,8	8	----	Course ID No.	
7	27,2	2	----	Course Type	
8	29,1	1	----	Instruction Method	
9	30,3	6	3	Theory Hours	
10	33,3	6	3	Laboratory Hours	
11	36,3	6	3	Total Contact Hours	
12	39,14	28	14	Contact Ratios	(7 entries)
13	53,14	28	14	Contact Hours	(7 entries)
14	67,3	6	3	Course Length	
15	70,3	6	3	Course Frequency	
16	73,3	6	3	Personnel Input	
17	76,3	6	3	Equipment Input	
18	79,3	6	3	Space Input	
19	82,2	4	2	Attrition Rate	
20	84,2	4	2	Setback Rate	
21	86,38	38	----	Unused	(blanks)

* prp - Physical record position
 ** lrp - Logical record position

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TABLES FILE FORMAT SPECIFICATIONS

Data File:

```
File name. . . . . TABLES 2
Approximate number of records. . . . . 4
Logical record length. . . . . 2460 + 420 sov (1st rec)
                                1980 + 300 sov (other recs)
```

Description:

This file contains statistical information necessary to run the cost model program "ECONOPRO".

Sample Programming:

Declaration:

```

DIM F(2,60, R$(60), L1(3,60), L2(2,60)

```

Data Retrieval/Storage:

```
Dataload DC #1, F(), R$(), L1() -- first rec
Dataload DC #1, F(), R$(), L2() -- other recs
```

Record Description:

Rec Pos	STR Pos	Dimension of Field	Bytes Packed	Description of Data Item	Comments
1	1,480	60 x 8		Fixed endpoints	1st rec. only
2	481,480	60 x 8		Var. endpoints	
3	961,60	60		Related cap.	
4	1021,480	60 x 8		regres. constant	
5	1501,480	60 x 8		regres. coef. 1	
6	1981,480	60 x 8		regres. coef. 2	

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PERCAP FILES FORMAT SPECIFICATIONS

User Files:

```

Number of files . . . . . 52
File names. . . . . 1234F15 (digits are
                        characters of UIC)
Approx. number of records . . . . . 4000 total
Password. . . . . (none)
KFAM blocking type. . . . . N
Logical record length . . . . . 397 + 6 sov = 403

```

Key Files:

```

Number of key files . . . . . 2 for each user file
Key file 1:
    Key Name . . . . . RMS cost code
    Position . . . . . *prp(10,4), **1rp(8,4)
Key file 2:
    Key Name . . . . . Distribution code
    Position . . . . . prp(14,7), 1rp(12,)

```

Description:

This file contains descriptive information about course groups and overhead levels. Direct training costs are listed for 40 different sources.

Sample Programming:

Declaration:

DIM B1\$37, B2\$60, B(4)75

Data Retrieval/Storage:

DATA LOAD DC #1, B1\$, B2\$, B()

Record Description:

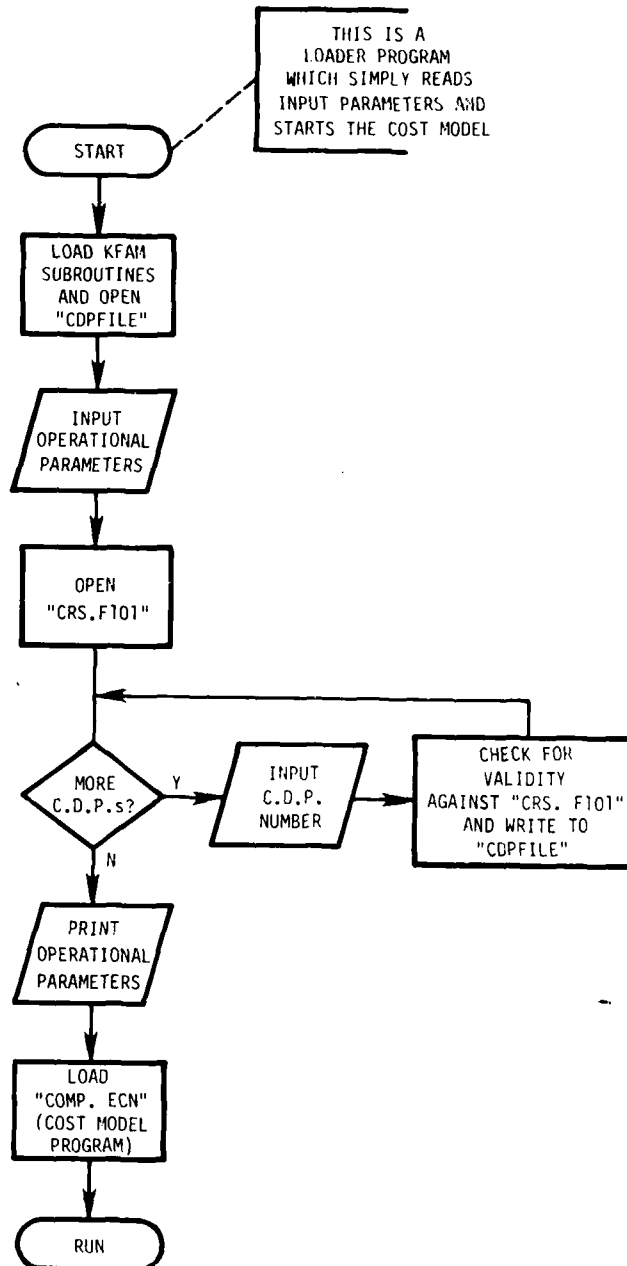
Rec Pos	STR Pos	Dimension of Field	Bytes Packed	Description of Data Item	Comments
1	1,37	37	----	Description, codes	
2	38,60	60	----	Names, Alpha data	
3	98,300	300	300	Cost data	

```
* prp - physical record position
** lrp - logical record position
```

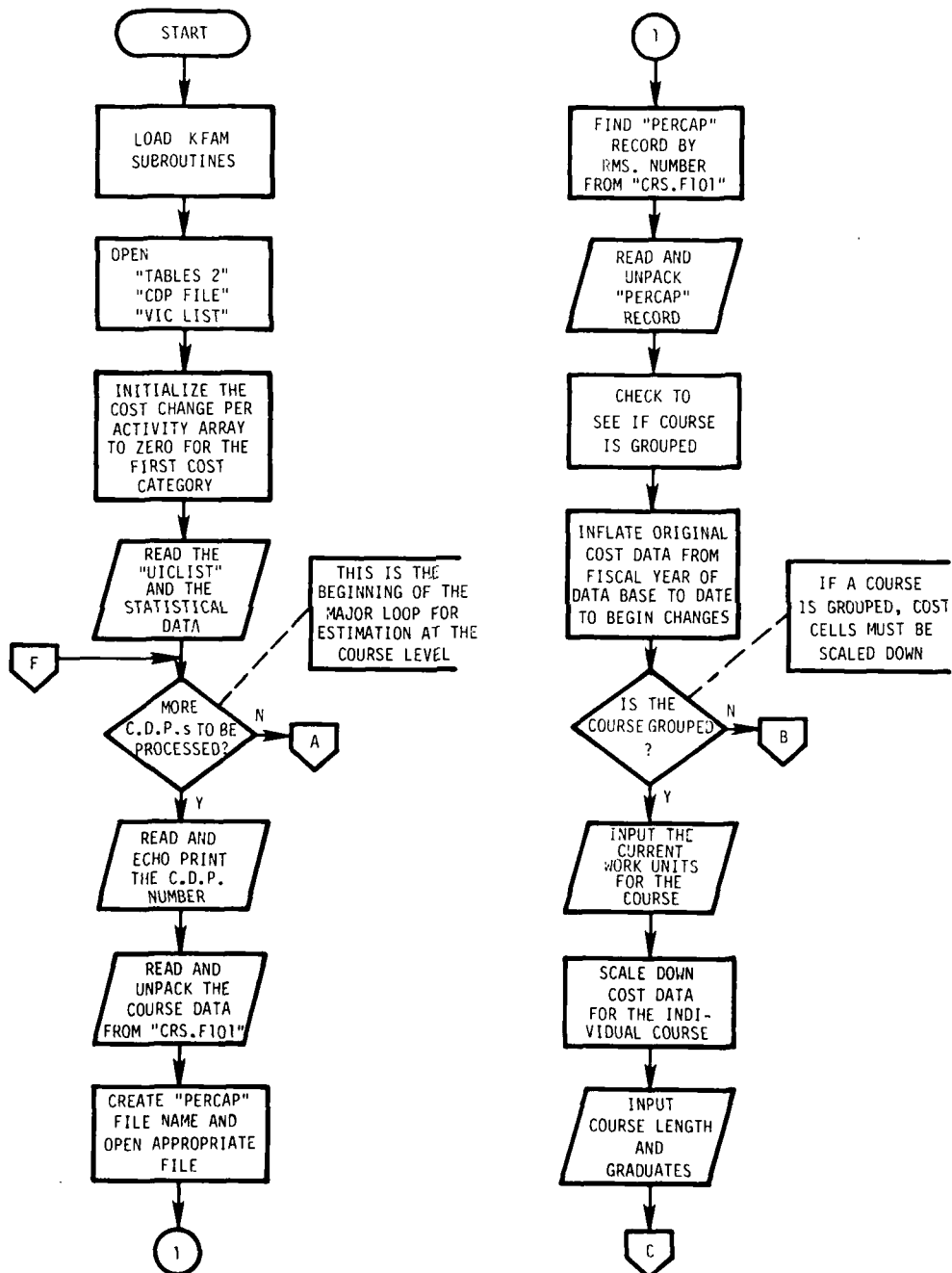
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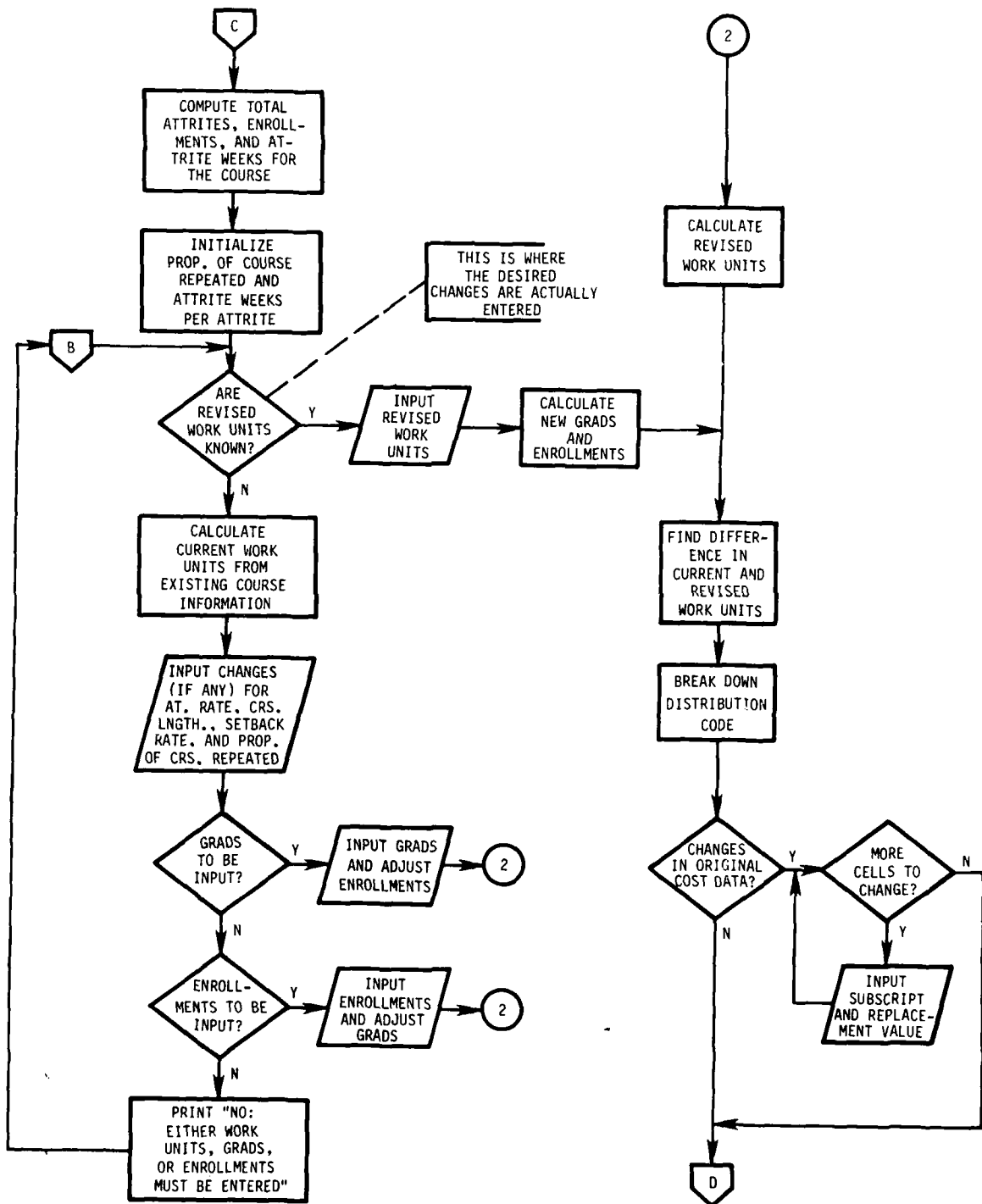
PROGRAM FLOW CHART

ECON

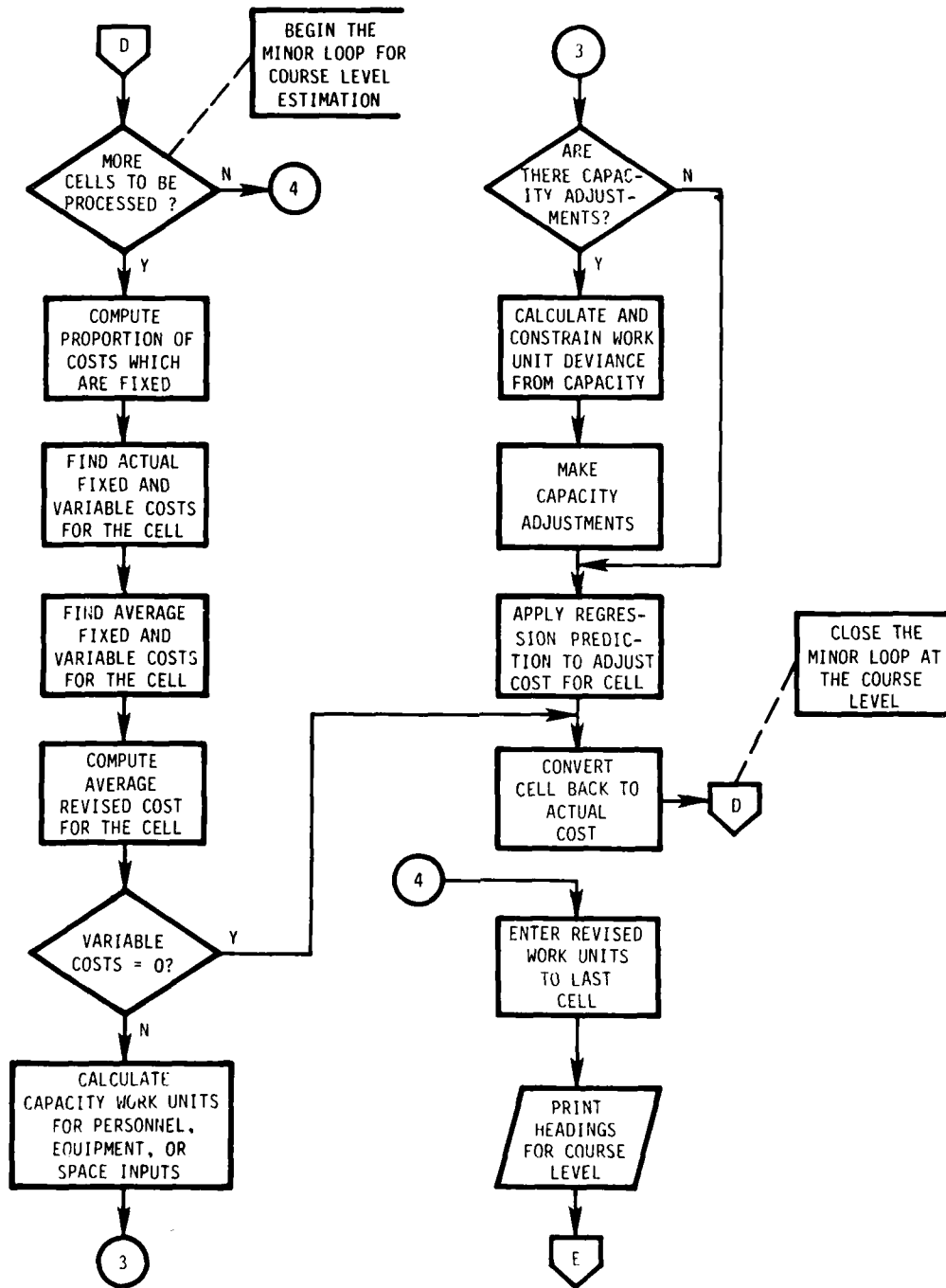


COMP. ECN

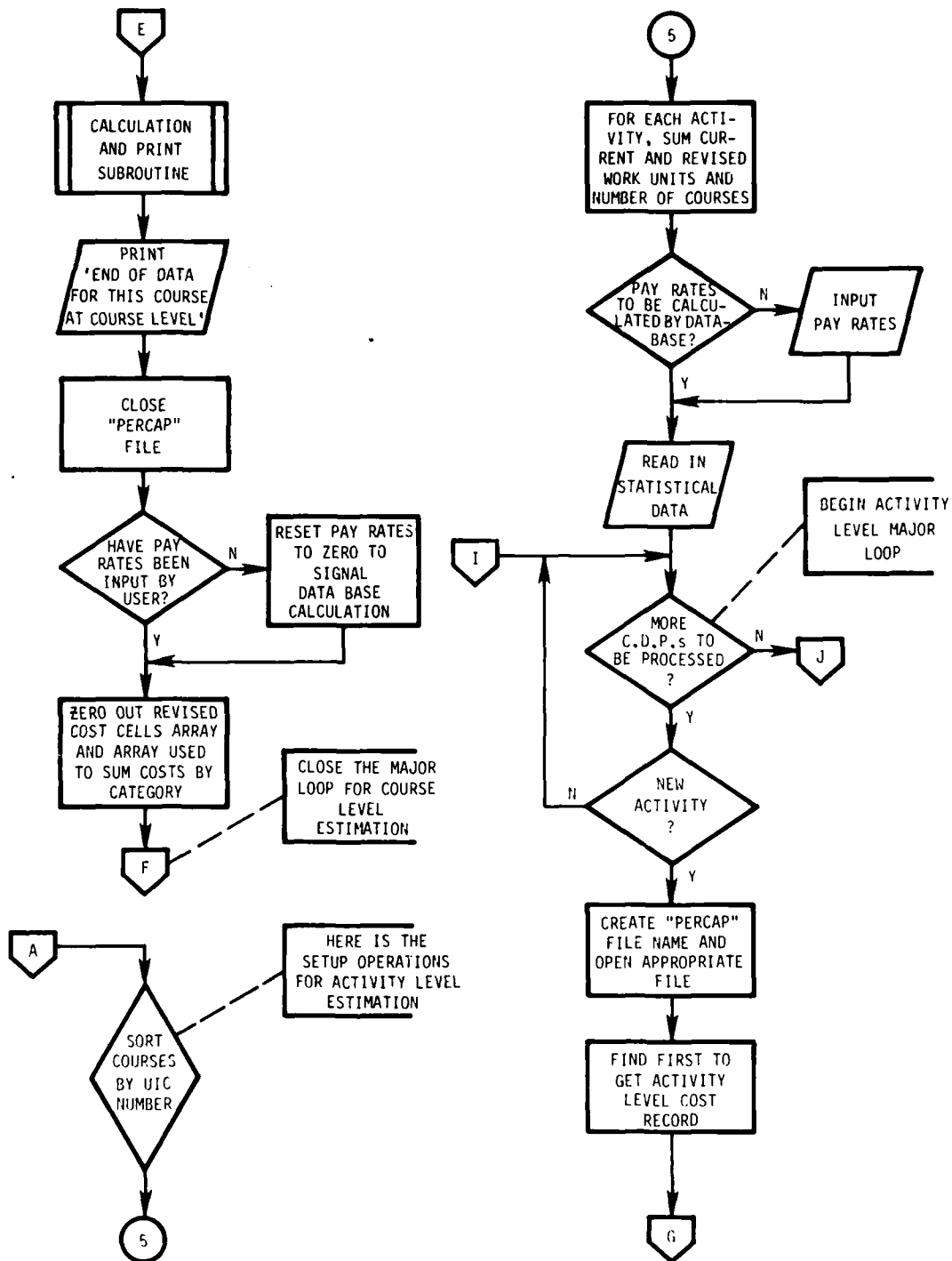


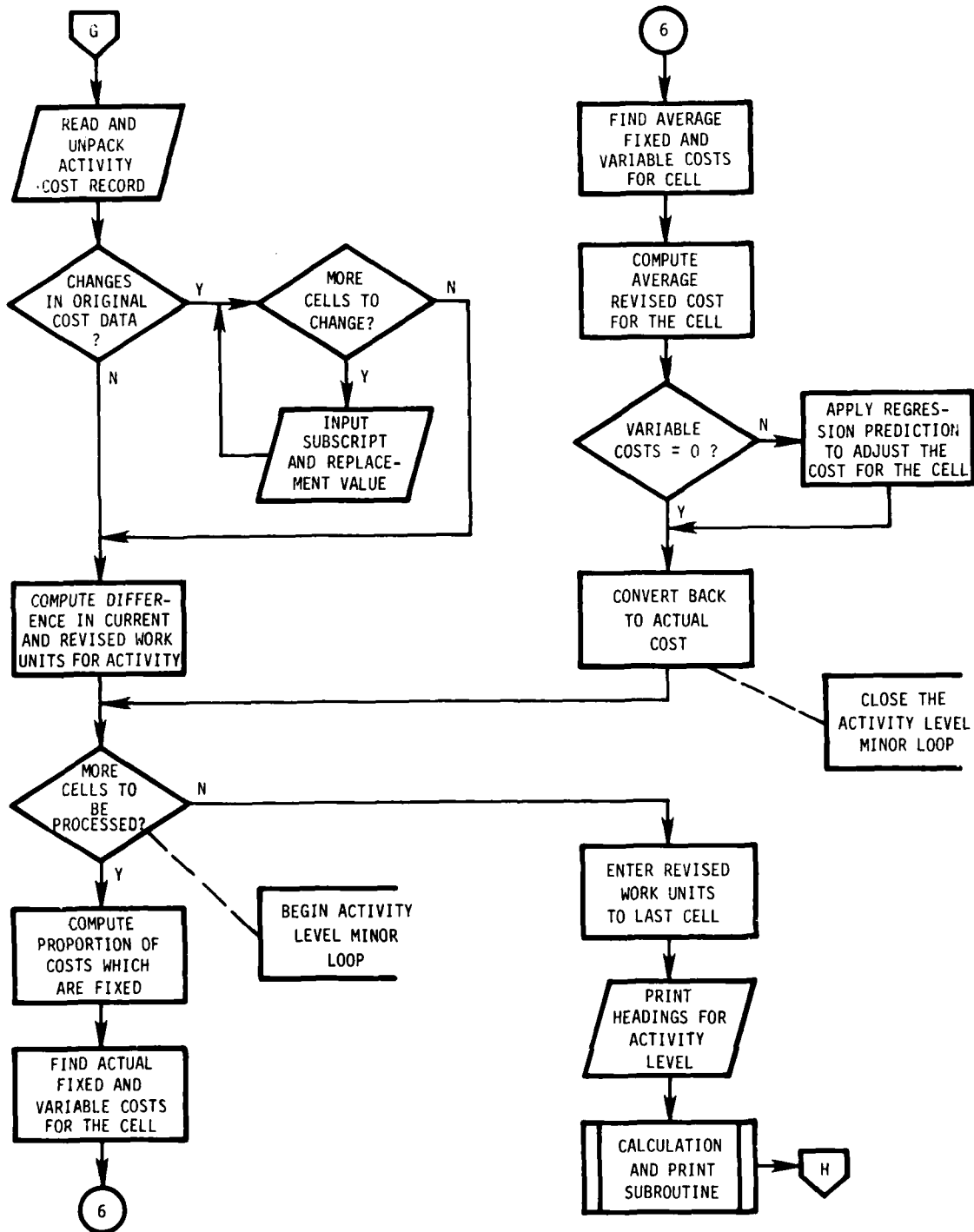


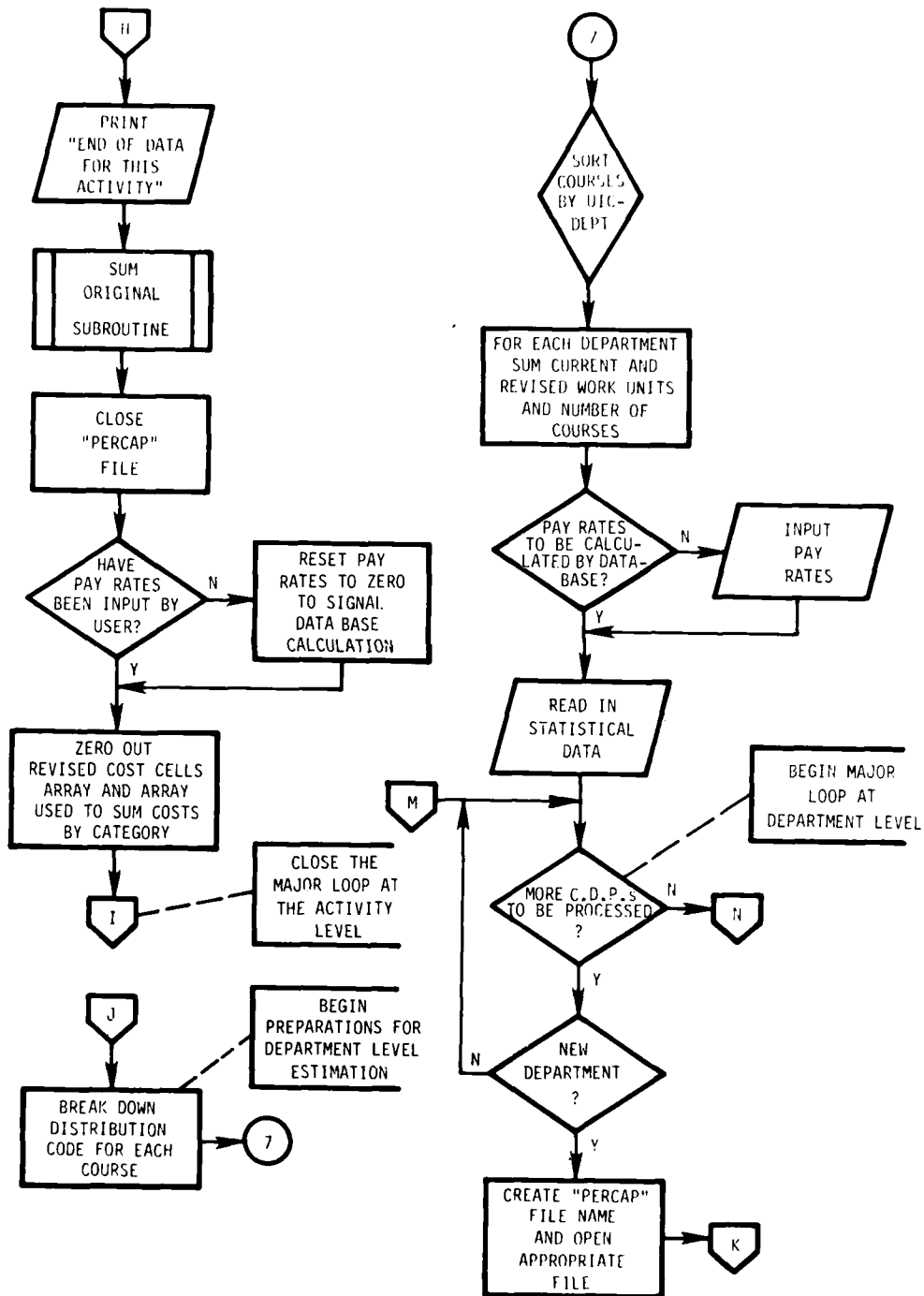
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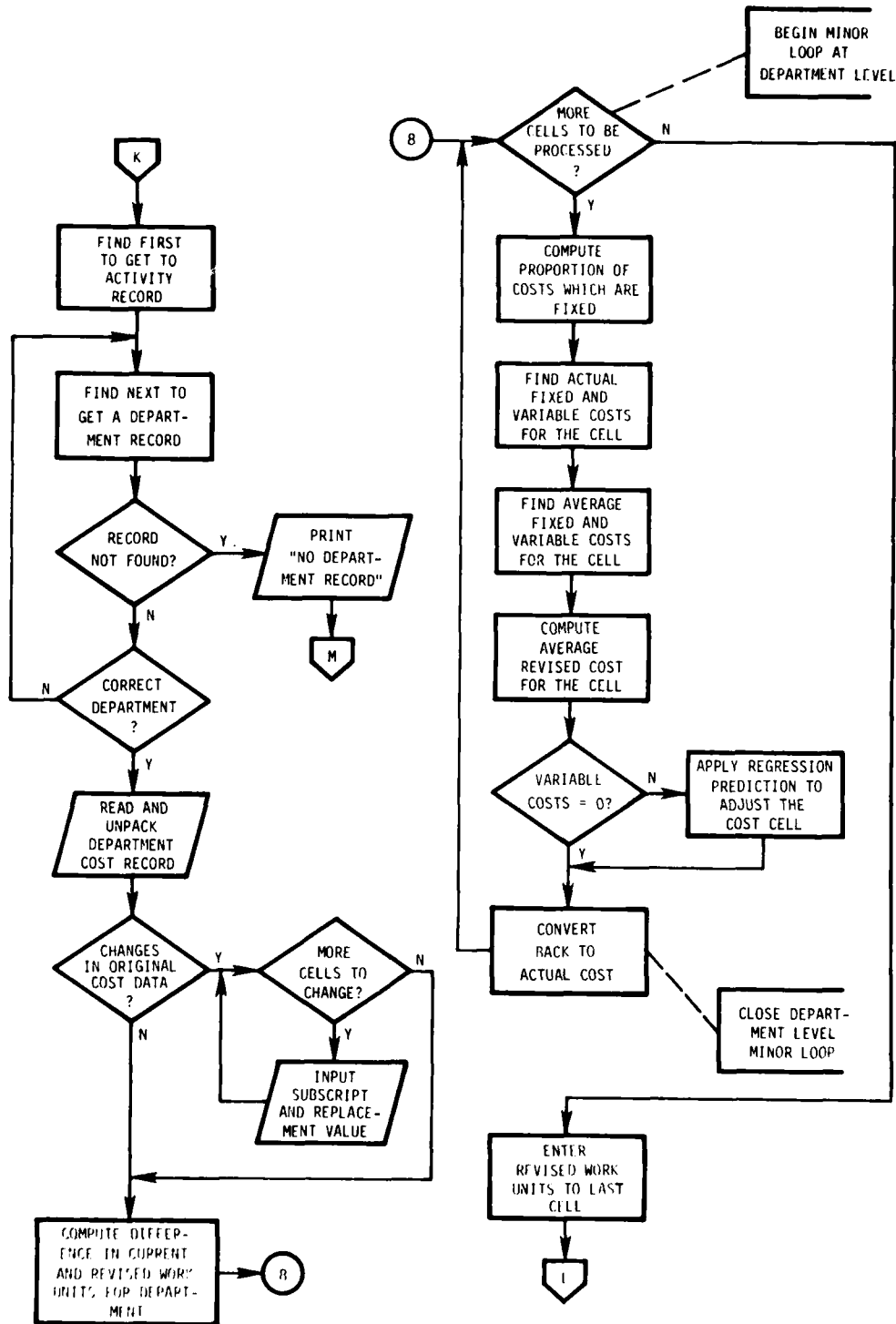
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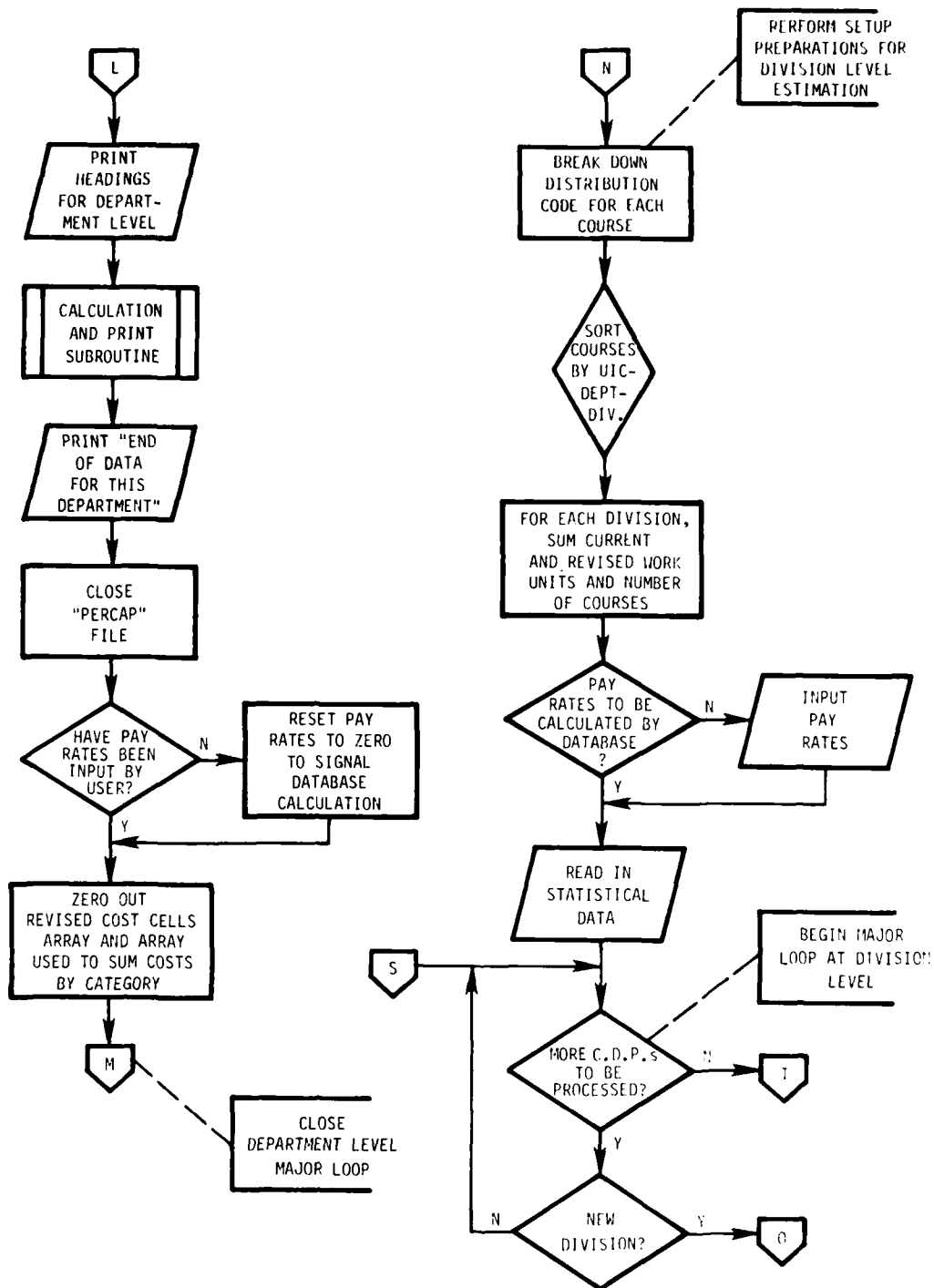


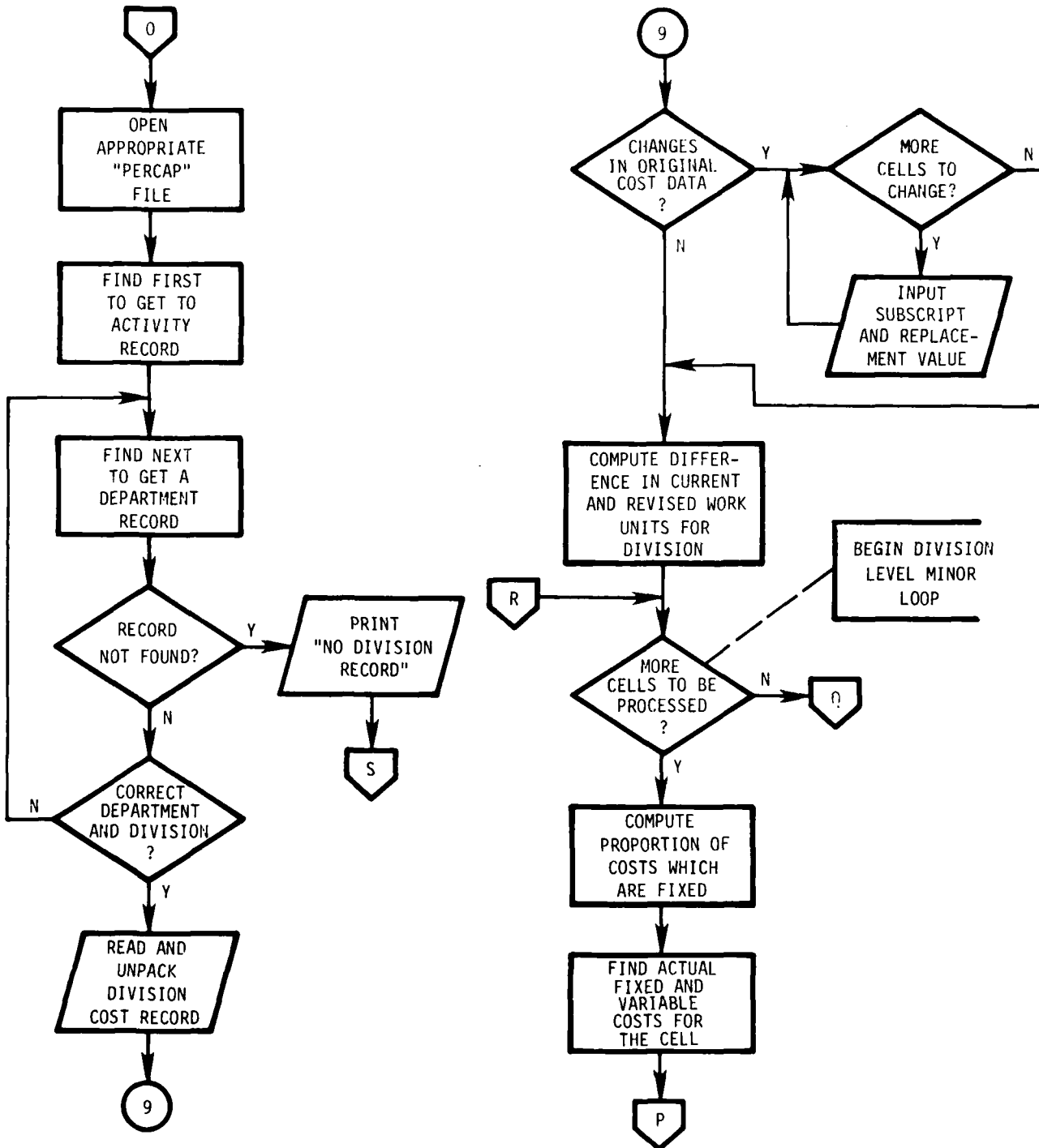


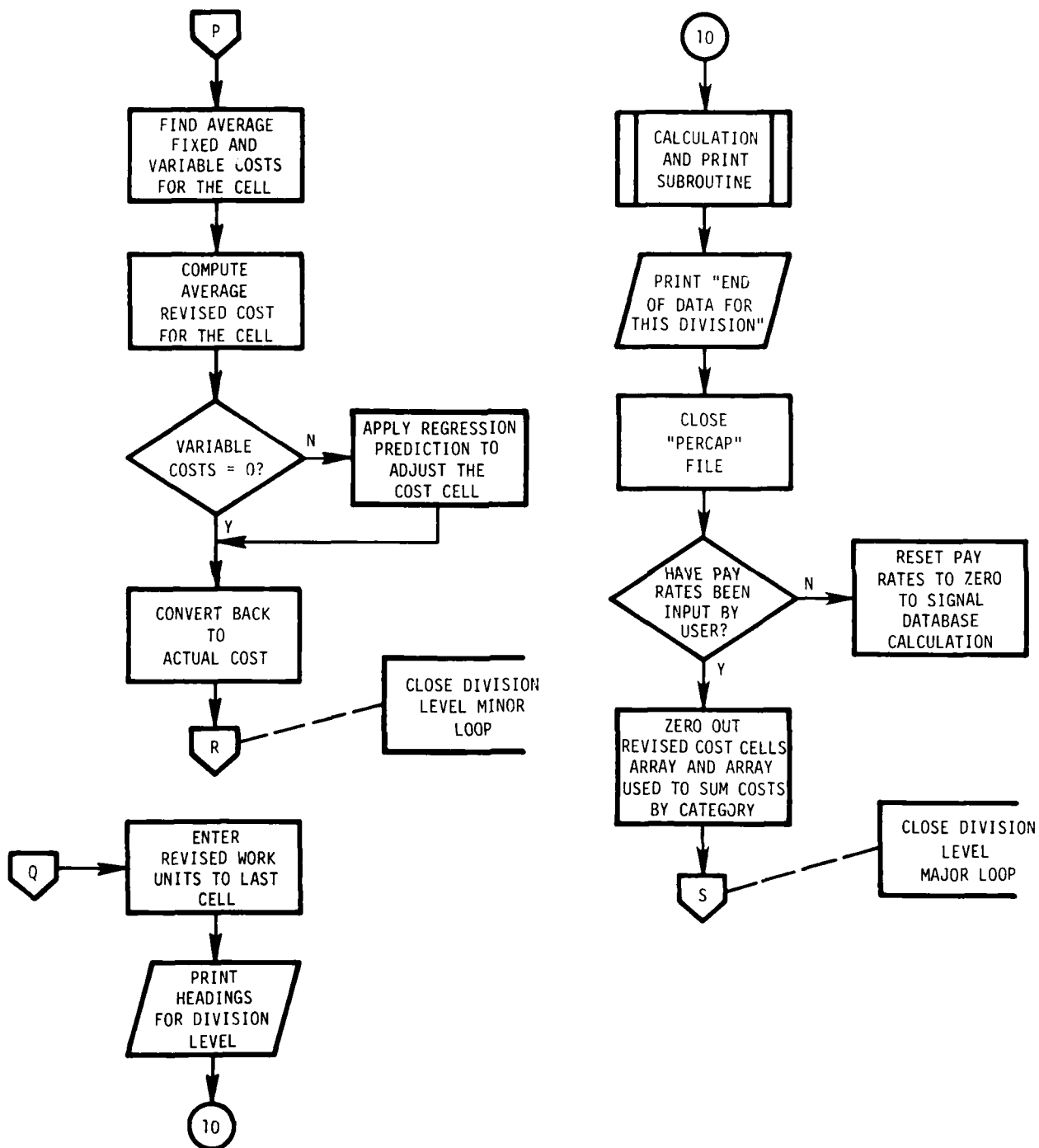
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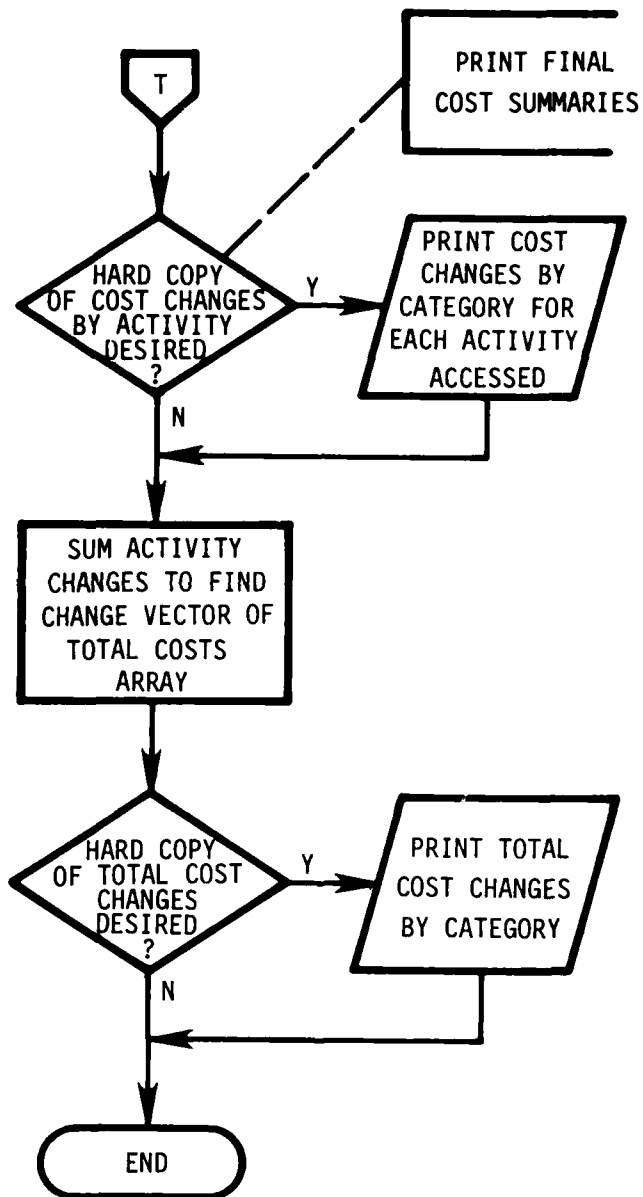


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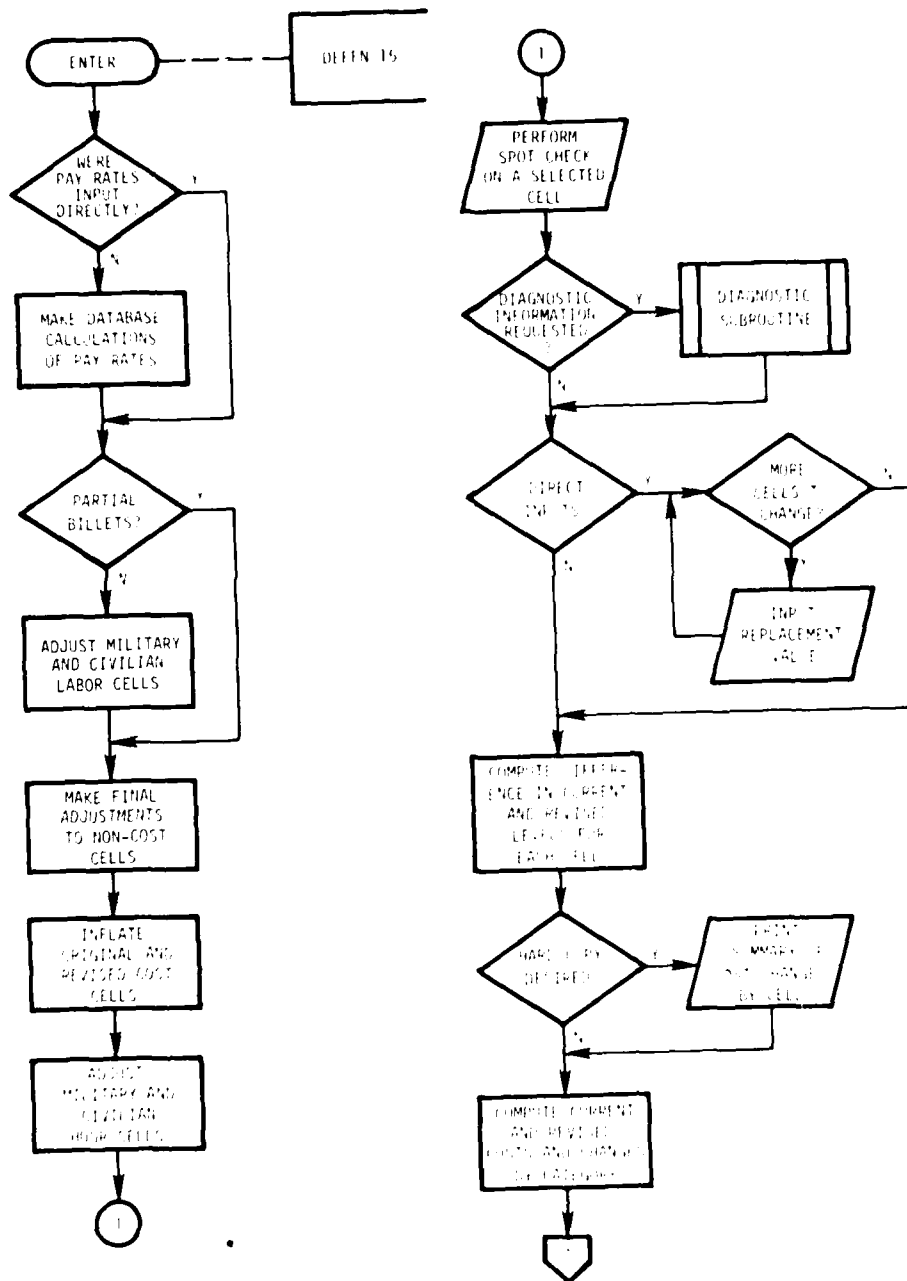


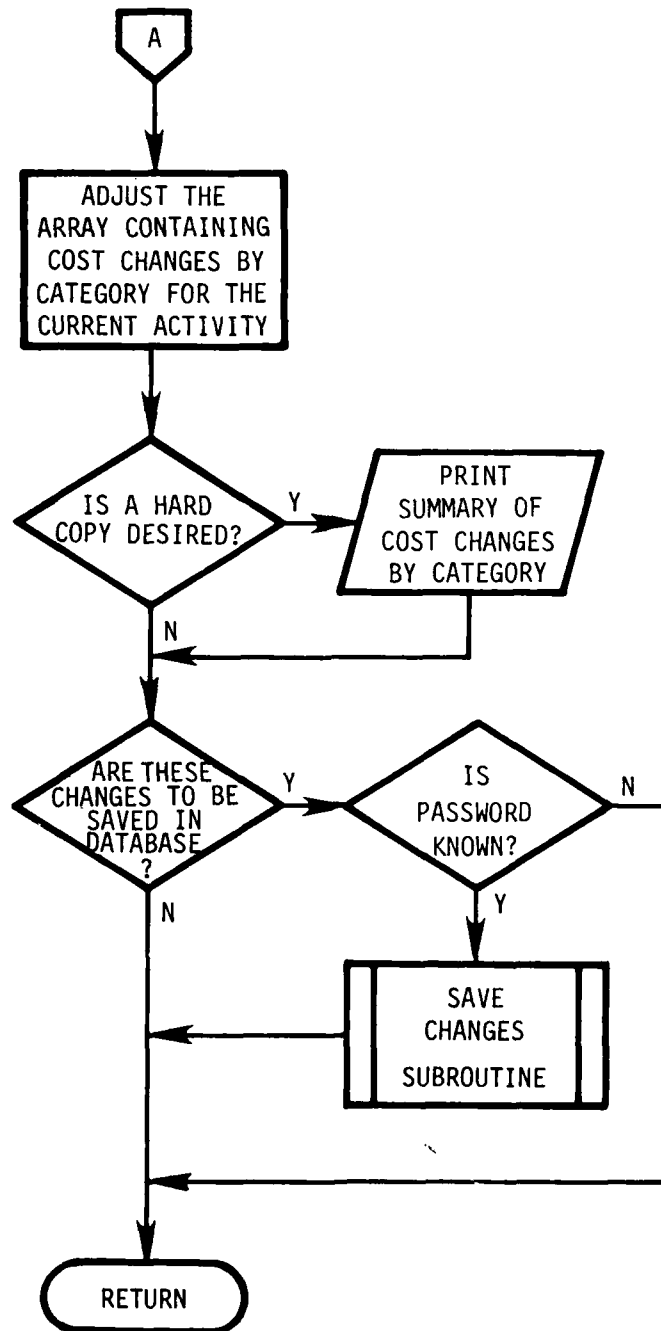




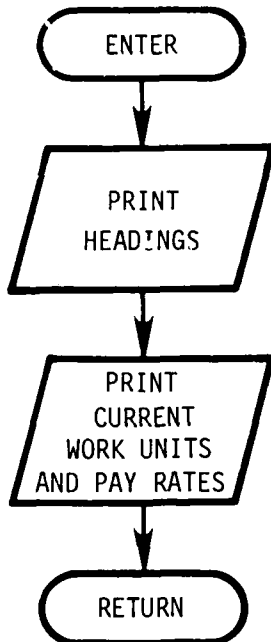
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CALCULATION AND PRINT SUBROUTINE

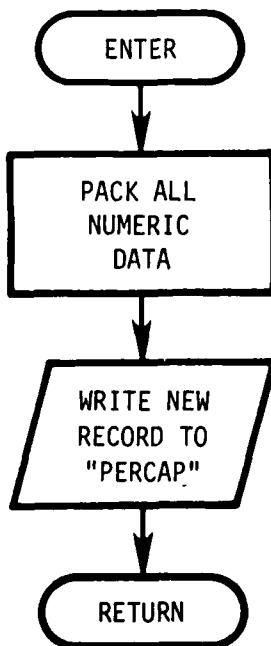




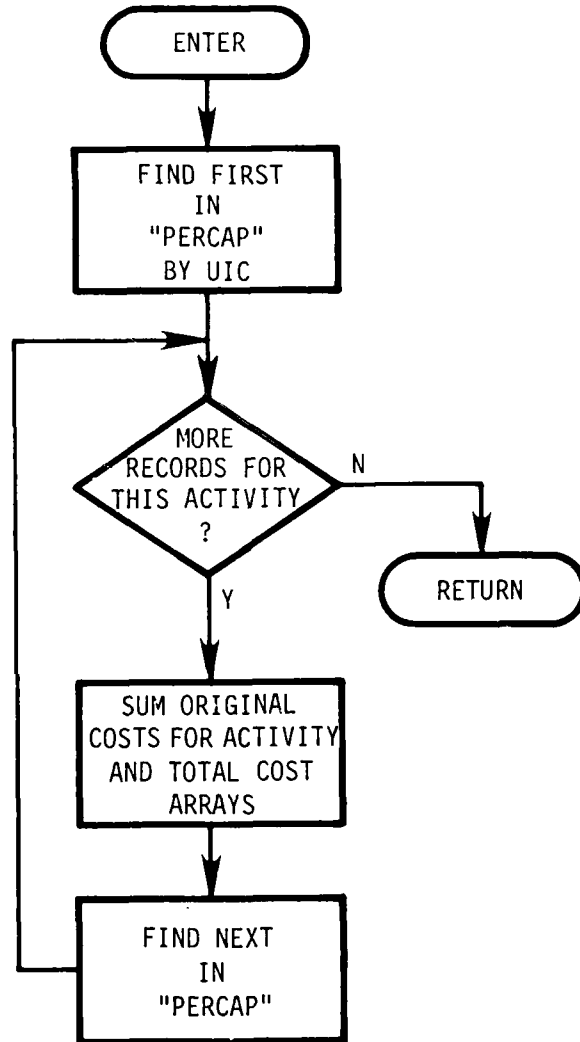
DIAGNOSTIC SUBROUTINE



SAVE CHANGES SUBROUTINE



SUM ORIGINAL SUBROUTINE



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PROGRAM LISTING

START PROGRAM FOR COST MODEL SYSTEM I

```
10 REM*** THIS START PROGRAM ENABLES CONTINUOUS RUNS OF THE COST
15 REM*** MODEL SYSTEM I BEGINNING EXECUTION WITH A LOAD RUN
20 PRINT HEX(030101);"***** COST MODEL SYSTEM I *****"; PRINT : PRINT
25 PRINT : PRINT TAB(20);" SYSTEM MENU -": PRINT : PRINT : PRINT TAB(20);"1) RUN COST MODEL"
30 PRINT : PRINT TAB(20);"2) EXIT SYSTEM": PRINT " PRINT
35 PRINT HEX(07): INPUT " * ENTER OPTION NUMBER DESIRED",Z: ON Z GO TO 45,50
40 PRINT "INVALID OPTION NUMBER, TRY AGAIN": GO TO 35
45 LOAD DC T#0, "ECON"
50 PRINT HEX(03): DATA SAVE DC CLOSE ALL: STOP "COST MODEL SYSTEM TERMINATED"
```

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*** ECON *** (2/10/80)

0010 REM %

*** PART ONE "ECON" ***

0030 REM %

COMMON KFAM VARIABLES

```

0035 COM I1,I2,R4,R5,N1,P1,N0,A3$1,A4$1,A5$1,A8$1,D1,D3,X$,A$3,B9$3,A9$1,P0$3,A7
      $1,A2$1,C5$1
0040 COM V7$8,T0$7,V9,V0$(3)2,T1(3)
0050 COM V0$2,V1$8,V2$2,V3$2,V4$2,V 6$1
0060 COM Q2$2,V5$1,V8$1,T5$30,T7$30
0070 COM T0,T9,T2$2,T4$3,T2,V8,T8.T1.T8$1.T2$(8)2
0080 COM T4,T5,V6,V7,V1,Q3$2,T(3)
0090 COM V7$(3)8,Q4$2,Q9$2,Q0$(4)G0.G.Q$1
0100 COM T9$2,T0$(4)60,T6$1,T3$3,T1$(1)2.T3$(1)33.V9$2.T1$30
0120 DIM D2$5
0130 LOAD DC T#0,"COMMKFAM" 8000, BEG 140

0140 DATA LOAD DC OPEN T#0, "CDPFILE"
0150 REM %

```

DATA ENTRY

```

0155 PRINT HEX(030A0A);" *** COST MODEL PROGRAM (ECON) ***"
      : PRINT HEX(0A0A)
      : LINPUT "PLEASE TYPE IN THE DEVICE ADDRESS OF THE PERCAPITA DATABASE ",-A$
      : IF POS("3BD")=STR(A$,1,1))*POS("1234567")=STR(A$.2,1))*POS("012345")=STR(A$,3,
      1))<>0 THEN 156
      : PRINT HEX(07)
      : GOTO 155

0156 LINPUT "ENTER THE DEVICE ADDRESS OF THE COURSE FILE",-B9$
      : IF POS("3BD")=STR(B9$,1,1))*POS("1234567")=STR(B9$.2,1))*POS("012345")=STR(B9$
      ,3,1))<>0 THEN 158
      : PRINT HEX(070C)
      : GOTO 156

0158 SELECT #1<A$>,#2<A$>,#3<B9$>,#4<B9$>
      : ERROR GOTO 160
0159 GOTO 161

0160 PRINT HEX(0703)
      : PRINT "AN ERROR OCCURRED IN SELECTING DEVICES: PLEASE RE-ENTER"
      : FOR I=1 TO 10000
      : NEXT I
      : GOTO 155

0161 LIMITS T#1,"DUMMY",H,E,L,P
      : ERROR GOTO 160
0162 LIMITS T#3,"DUMMY",H,E,L,P
      : ERROR GOTO 160
0165 INPUT "ENTER INFLATION RATE FOR MPN (DECIMAL NUMBER)".I1
      : ERROR PRINT HEX(070C)
      : GOTO 165

0170 INPUT "ENTER INFLATION RATE FOR O&NN (DECIMAL NUMBER)".I2

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: ERROR PRINT HEX(070C)
: GOTO 170

0175 INPUT "ENTER NUMBER OF COURSES TO BE ALTERED".N1
: ERROR PRINT HEX(070C)
: GOTO 175

0180 PRINT "IF YOU WISH TO USE EXISTING DATA BASE PAY RATES HIT RETURN."
: PRINT "OTHERWISE ENTER AVERAGE ANNUAL MILITARY PAY (COURSE LEVEL) FOR THE
YEAR"
: INPUT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS".R4
: ERROR PRINT HEX(070C)
: GOTO 180

0185 IF R4=0 THEN 190
: A8$="I"

0187 PRINT "ENTER AVERAGE ANNUAL CIVILIAN PAY (COURSE LEVEL) FOR THE YEAR"
: INPUT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS".R5
: ERROR PRINT HEX(070C)
: GOTO 187

0190 INPUT "ENTER THE FISCAL YEAR OF THE DATABASE. (yy) ".D
: ERROR PRINT HEX(070C)
: GOTO 190

0195 INPUT "ENTER THE DATE TO BEGIN IMPLEMENTING CHANGES. (mm/yy) ".D2$
0196 CONVERT STR(D2$,4,2) TO D2
: ERROR PRINT HEX(070C)
: INPUT "PLEASE RE-ENTER THE DATE TO BEGIN IMPLEMENTING CHANGES (mm/yy)".D2$
: GOTO 196

0197 CONVERT STR(D2$,1,2) TO D4
: ERROR PRINT HEX(070C)
: INPUT "PLEASE RE-ENTER THE DATE TO BEGIN IMPLEMENTING CHANGES (mm/yy)".D2$
: GOTO 196

0198 IF D4>0 AND D4<13 THEN 199
: PRINT HEX(070C);TAB(80);HEX(0D0C)
: PRINT "AN INVALID DATE HAS BEEN ENTERED: PLEASE RE-ENTER"
: GOTO 195

0199 D1=(D2-D)*12+D4-9
0200 INPUT "ENTER THE PLANNING PERIOD (IN MONTHS)".P1
: ERROR PRINT HEX(070C)
: GOTO 200

0205 PRINT "ENTER THE LENGTH OF TIME AFTER THE PLANNING PERIOD EXPIRES,"
: INPUT "BEFORE COST ESTIMATES ARE NEEDED. (IN MONTHS. MAY BE 0)".D3
: ERROR PRINT HEX(070C0C)
: GOTO 205

0210 PRINT HEX(0A)
0220 PRINT HEX(0C)
: INPUT "DO YOU WISH TO CALCULATE LABOR COSTS BASED ON PARTIAL BILLETS (Y/N)"
,A3$
: IF A3$<>"Y" AND A3$<>"N" THEN 220
: PRINT HEX(0A0A)
0230 PRINT HEX(0C0C)
: PRINT "WILL YOU WANT TO MAKE ANY CHANGES IN THE ORIGINAL COST DATA BEFORE E
STIMATING"

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: INPUT "NEW COSTS (Y/N)",A4$
: IF A4$<>"Y" AND A4$<>"N" THEN 230
: PRINT HEX(0A)
: GOSUB 230(1,3,4,2,"CRS.F101")
: IF G$<>" " THEN 390
0235 PRINT HEX(0C)
: INPUT "DO YOU WISH TO BYPASS CAPACITY ADJUSTMENTS (Y/N)",A7$
: IF A7$<>"Y" AND A7$<>"N" THEN 235
: PRINT HEX(0A)
0237 PRINT HEX(0C)
: INPUT "DO YOU WISH TO BYPASS SCALE ADJUSTMENTS (Y/N)",A2$
: IF A2$<>"Y" AND A2$<>"N" THEN 237
: PRINT HEX(0A)
0238 PRINT HEX(0C)
: INPUT "WOULD YOU LIKE FIXED AND VARIABLE COSTS PRINTED (Y/N)",C5$
: IF C5$<>"Y" AND C5$<>"N" THEN 238
: PRINT HEX(0A)
0240 PRINT HEX(0C)
: INPUT "WILL YOU WANT HARD COPIES OF COST SUMMARIES FOR EACH RECORD (Y/N)",
A5$
: IF A5$<>"Y" AND A5$<>"N" THEN 240
: PRINT HEX(0A)
0243 PRINT HEX(0C)
: LINPUT "ENTER THE DEVICE ADDRESS OF THE LINE PRINTER TO BE USED"-P0$
: PRINT HEX(0A)
: IF POS("02"=STR(P0$,1,1))*POS("01"=STR(P0$,2,1))*POS("456"=STR(P0$,3,1))<>0
THEN 245
: PRINT HEX(070C)
: GOTO 243
0245 PRINT HEX(0C)
: INPUT "WILL YOU WANT TO ALTER THE DATABASE TO SAVE THE REVISED COST ESTIMAT
ES (Y/N)",A9$
: IF A9$<>"Y" AND A9$<>"N" THEN 245
: IF A9$<>"Y" THEN 248
0246 LINPUT "ENTER THE PASSWORD FOR DATA BASE ALTERATION",-X$
: IF X$="PASSWORD" THEN 248
: PRINT HEX(07),"SORRY THAT IS NOT IT. TRY ENTERING IT AGAIN."
0247 LINPUT -X$
: IF X$="PASSWORD" THEN 248
: PRINT HEX(07),"SORRY, YOU CAN'T ALTER THE DATA WITHOUT THE PASSWORD"
: X$=" "
: FOR I=1 TO 10000
: NEXT I
0248 DIM N2$4,B0$1
0250 PRINT HEX(03)
: PRINT " *** C D P VALIDITY CHECK ***"
: PRINT HEX(0A)
: PRINT "AS A CHECK ON AVAILABILITY OF DATA. PLEASE ENTER EACH CDP YOU WISH T
O REVISE"
: FOR B=1 TO N1
0260 PRINT "CDP #";B;
: LINPUT -N2$
: GOSUB 232(1,0,N2$)
: IF G$=" " THEN 280
0265 INPUT " SORRY, DATA IS NOT AVAILABLE FOR THAT CDP. DO YOU WISH TO REPLAC
E IT OR OMIT IT (R OR O)",B0$
: IF B0$<>"R" AND B0$<>"O" THEN 265
0270 IF B0$="R" THEN 260
: N1=N1-1

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: IF N1=0 THEN GOSUB ' 15
: GOTO 290

0280 PRINT "VALID CDP. DATA IS AVAILABLE"
0290 IF B0*="D" THEN 300
: DATA SAVE DC #0,N2*
0300 B0*=" "
: NEXT B
: N0=2*N1
: SELECT PRINT <P0*>(130)
: PRINT HEX(0C0A0A0A0E)
: PRINT " *** COST MODEL PROGRAM ***"
: DATA SAVE DC #0, END
0310 PRINT HEX(0A0A0E)
: PRINT "* INPUT PARAMETERS *"
: PRINT HEX(0A0A0E)
0320 PRINT "INFLATION RATE FOR MPN ":I1
: PRINT HEX(0A0E)
: PRINT "INFLATION RATE FOR D&MN ":I2
: PRINT HEX(0A0E)
0330 IF R4=0 THEN 340
: PRINT "AVERAGE MILITARY PAY ":R4
: PRINT HEX(0A0E)
: PRINT "AVERAGE CIVILIAN PAY ":R5
: PRINT HEX(0A0E)
0340 PRINT "NUMBER OF COURSES TO BE ALTERED ":N1
: PRINT HEX(0A0E)
: PRINT "PLANNING TIME (IN MONTHS) ":P1
: PRINT HEX(0A0E)
0350 PRINT "PARTIAL BILLETS ? ":A3*
: PRINT HEX(0A0E)
: PRINT "ORIGINAL DATA CHANGES ? ":A4*
: PRINT HEX(0A0E)
: PRINT "SAVE REVISED COST ESTIMATES ? ":A9*
: PRINT HEX(0A0E)
0360 PRINT "COPIES OF COST SUMMARIES ? ":A5*
: PRINT HEX(0A0E)
0365 PRINT "BYPASS CAPACITY ADJUSTMENTS ? ":A7*
: PRINT HEX(0A0E)
0370 PRINT "BYPASS SCALE ADJUSTMENTS ? ":A2*
: PRINT HEX(0A0E)
0375 PRINT "PRINT FIXED AND VARIABLE COSTS ? ":C5*
: PRINT HEX(0A0A0C0E)
0380 LOAD DC T#0,"COMP.ECN"

0390 GOSUB ' 239(1)
: IF G*=" " THEN 400
: PRINT "ERROR IN KFAM OPEN; PRESS ANY KEY TO RETURN TO MENU"
: KEYIN A5*
: LOAD DC T#0,"COSTMENU"0,9999 BEG 10

0400 GOSUB ' 230(1,3,4,2,"CRS.F101")
: IF G*=" " THEN 235
: GOTO 390

0450 DEFFN ' 15
: GOSUB ' 239(1)
: RETURN CLEAR ALL

: COM CLEAR

: LOAD DC T#0,"COSTMENU"0,9999 BEG 100

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*** ECON *** (2/10/80)

A* - 0035 0155 0158
A2* - 0035 0237 0370
A3* - 0035 0220 0350
A4* - 0035 0230 0350
A5* - 0035 0240 0360 0390
A7* - 0035 0235 0365
A8* - 0035 0185
A9* - 0035 0245 0350
B - 0250 0260 0300
B0* - 0248 0265 0270 0290 0300
B9* - 0035 0156 0158
C5* - 0035 0238 0375
D - 0190 0199
D1 - 0035 0199
D2 - 0196 0199
D2* - 0120 0195 0196 0197
D3 - 0035 0205
D4 - 0197 0198 0199
E - 0161 0162
H - 0161 0162
I - 0160 0247
I1 - 0035 0165 0320
I2 - 0035 0170 0320
L - 0161 0162
N0 - 0035 0300
N1 - 0035 0175 0250 0270 0300 0340
N2* - 0248 0260 0290
P - 0161 0162
P0* - 0035 0243 0300
P1 - 0035 0200 0340
Q - 0090
Q* - 0090 0230 0260 0390 0400
Q0* - 0090
Q2* - 0060
Q3* - 0080
Q4* - 0090
Q9* - 0090
R4 - 0035 0180 0185 0330
R5 - 0035 0187 0330
T - 0080
T0 - 0070
T0* - 0040
T0* - 0100
T1 - 0070
T1* - 0100
T1 - 0040
T1* - 0100
T2 - 0070
T2* - 0070
T2* - 0070
T3* - 0100
T3* - 0100
T4 - 0080
T4* - 0070
T5 - 0080
T5* - 0060
T6* - 0100
T7* - 0060
T8 - 0070
T8* - 0070
T9 - 0070
T9* - 0100
V0* - 0050
V0* - 0040
V1 - 0080
V1* - 0050
V2* - 0050
V3* - 0050
V4* - 0050
V5* - 0060
V6 - 0080
V6* - 0050
V7 - 0080
V7* - 0040
V7* - 0090
V8 - 0070
V8* - 0060
V9 - 0040
V9* - 0100
x* - 0035 0246 0247

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*** COMP.ECN *** (2/10/80)

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0040 LOAD DC T#0,"COMMKFAM"8000,BEG50

0050 COM X$(N1)9,X1$(N1)7,C(N1)
0060 COM U1$(N1)5,U$(N1)5,R3(N1),W(N1),G$(N1)2,W$N0,G(N1),D1$(N1)2,D2$(N1)2,D$(N1)2,D0$(N1)2,S1(N1),S2(N1)
0070 SELECT #1<B9$>,#2<A$>,#3<B9$>,#4<B9$>,#5<A$>,#6<A$>
0150 DIM F(60,2),R$(60)1,L1(60,3),I2(60,2),R2$(60)1,L2(60,2),F3(60,2),R3$(60)1,L3(60,2),F4(60,2),R4$(60)1,L4(60,2),I1$(4)15,A0$1,A0$(46)8,A9$(46)6,Z0$1
0160 DIM N2$4,C0(60),A1$1,I4(60),U$7,K$(60)5,A$(2)124,B$(4)75,B(60),U1$5,R1$4,B1$37,B2$60,C2$4,C3$8,C4$2,D$4,K1$(1)2,Z$1,A6$1
0170 DIM A1(10,60),A2(10,60),R(2,10),O(2,10),F1(60),V(60)
      : DATA LOAD DC OPEN T#1,"TABLES2"
      : DATA LOAD DC OPEN T#0,"CDPFILL"
0180 FOR H=1TO 60
      : A2(1,H)=0
      : NEXT H
0181 RESTORE LINE 182
0182 DATA "M.HR","C.HR","M.LB","C.LB","SUPP","CONT","MISC","M.HR","C.HR","M.LB","C.LB","SUPP","CONT","MISC","M.LB","MISC","M.LB","MISC","MISC","MISC","M.LB","MISC","M.LB","MISC"
0183 DATA "M.LB","C.LB","SUPP","CONT","MISC","M.LB","M.LB","MISC","MISC","MISC","MISC","M.LB","MISC","M.LB","M.LB","MISC","M.LB","AT-WKS","GRADS","LENGTH","ATRTS","W.UTS"
0184 INIT(20) A0$(),A9$()
0185 A0$(1)="DIRECT"
      : A0$(8)="AC-FC-SP"
      : A0$(15)="HOST-ACT"
      : A0$(17)="OT-ACT"
      : A0$(19)="TR-EQ-MT"
      : A0$(20)="MJ-PJT"
      : A0$(21)="ADP"
      : A0$(23)="CNETS"
      : A0$(25)="FN.CMD"
0186 A0$(30)="STF.PCS"
      : A0$(31)="STF.BMD"
      : A0$(33)="STF-F.H."
      : A0$(34)="EQ.DEP"
      : A0$(35)="BLD.DEP"
      : A0$(36)="STU.BMD"
      : A0$(38)="STU-F.H."
      : A0$(39)="STU.TUL"
      : A0$(41)="STU-SAL"
0187 A0$(42)="STA.DATA"
0188 MAT READ A9$
0190 DATA LOAD DC OPEN T#2,"UICLIST"
0200 DATA LOAD DC #2,K$()
0210 DATA LOAD DC #1,F(),R$(),L1()
0230 FOR I=1TO N1
      : SELECT PRINT 005(80)
0240 DATA LOAD DC #0,N2$
      : PRINT HEX(03)
      : PRINT " CDP NUMBER FOR COURSE #":I:" ":N2$
0260 GOSUB '232(1,0,N2$)
0270 IF G$(<)" "THEN 4170
0280 DATA LOAD DC #4,A$()
0290 GOSUB '20
      : E=Q
0300 U1$=STR(A$(Q),4,5)

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: U1$(I)=U1$
0310 STR(U$,1,4)=STR(U1$,1,4)
: STR(U$,5,2)="F1"
: STR(U$,7,1)=STR(U1$,5,1)
0320 GOSUB '230(2,5,6,1,U$)
0330 IF Q$<>" " THEN GOSUB 4180
: Q=E
0340 R1$=STR(A$(Q),9,4)
0350 GOSUB '232(2,0,R1$)
0360 IF Q$<>" " THEN 4190
0370 DATA LOAD DC #6,B1$,B2$,B$()
0380 GOSUB '35
0390 IF C<=1 THEN 399
: Z$="G"
: GOTO 420

0399 GOSUB '237(1)
: IF Q$=" " THEN 400
: IF Q$="E" THEN Z$=" "
: IF Q$<>"E" THEN 4200
: GOTO 440

0400 DATA LOAD DC #4,A$()
: GOSUB '20
: IF C>1 THEN Z$="G"
: GOSUB '232(1,0,N2$)
: IF Q$<>" " THEN 4170
0420 DATA LOAD DC #4,A$()
: GOSUB '20
0430 FOR J=1 TO D1
0440 RESTORE LINE 441
0441 DATA 3,10,15,17,21,23,25,31,30,36,39,41
0442 DATA 4,11,26,5,12,27,6,13,28,7,14,16,18,22,24,29,32,33,19,20,34,35,37,28,34

0443 FOR M=1 TO 12
: READ X
: B(X)=B(X)+(I1/12)*B(X)
: NEXT M
0444 FOR M=1 TO 25
: READ X
: B(X)=B(X)+(I2/12)*B(X)
: NEXT M
0445 NEXT J
0446 IF Z$<>"G" THEN 452
: PRINT HEX(0A0A0A0A)
: PRINT " ** GROUPED COURSE **"
: PRINT "PLEASE ENTER CURRENT (ORIGINAL) LEVEL WORK UNITS FOR CDP ";N2$
: PRINT "(CURRENT WORK UNITS FOR THE ENTIRE GROUP =":B(60):")"
: INPUT B2
: ERROR PRINT HEX(070C0C0C0C0C0C0C0C)
: GOTO 446

0447 FOR F=1 TO 41
: B(F)=B(F)*B2/B(60)
: NEXT F
: X1=B(43)+B(45)
: IF B(45)=0 THEN B(45)=.0001
: X7=B(42)/B(45)
: X3=B(45)/X1
0448 INPUT "ENTER NUMBER OF GRADUATES".B(43)

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: ERROR PRINT HEX(070C)
: GOTO 448

0449 INPUT "ENTER COURSE LENGTH (CALENDAR DAYS)".B(44)
: ERROR PRINT HEX(070C)
: GOTO 449

0450 B(45)=(X3*B(43))/(1-X3)
: X1=B(43)+B(45)
: B(42)=X7*B(45)
: B(60)=B2
0452 PRINT HEX(0A0A0A0A)
0453 PRINT HEX(0C0C0C)
: X9=B(44)
: PRINT "DO YOU ALREADY KNOW THE REVISED WORK UNITS YOU WISH"
: PRINT "TO INPUT FOR THAT COURSE ? (CUR. W.U. = ":B(60):") Y/N"
: INPUT A1$
: IF A1$<>"Y" AND A1$<>"N" THEN 453
: X6=.1
: X2=B(43)
: X1=X2+B(45)
: X3=B(45)/X1
: IF B(45)=0 THEN X7=0
: IF B(45)=0 THEN 455
: X7=B(42)/B(45)
0455 IF A1$="Y" THEN 510
: G1=B(44)*X2+7*X7*X1*X3+X2*X5*X6*B(44)
: X3=ROUND(X3,2)
: W1=G1/30
: PRINT "IF YOU DO NOT WISH TO CHANGE THE FOLLOWING MODEL PARAMETERS, HIT RET
URN."
: PRINT "OTHERWISE ENTER THE REPLACEMENT VALUE"
: PRINT HEX(0A)
0460 PRINT "ESTIMATED ATTRITION RATE ":X3
: INPUT X3
: ERROR PRINT HEX(07)
: PRINT HEX(0C0C)
: GOTO 460

0461 PRINT "COURSE LENGTH IN CALENDAR DAYS ":B(44)
: INPUT B(44)
: ERROR PRINT HEX(07)
: PRINT HEX(0C0C)
: GOTO 461

0462 PRINT "ESTIMATED SET-BACK RATE ":X5
: INPUT X5
: ERROR PRINT HEX(07)
: PRINT HEX(0C0C)
: GOTO 462

0463 PRINT "PROPORTION OF THE COURSE REPEATED FOR THE AVERAGE SET-BACK.":X6
: INPUT X6
: ERROR PRINT HEX(07)
: PRINT HEX(0C0C)
: GOTO 463

0470 INPUT "DO YOU WISH TO SPECIFY THE NUMBER OF GRADUATES. (Y/N)".A0$
: IF A0$<>"Y" AND A0$<>"N" THEN 470
: IF A0$="N" THEN 480

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0475 PRINT "ENTER NUMBER OF OUTPUTS (GRADUATES)":X2
: INPUT X2
: ERROR PRINT HEX(070C0C)
: GOTO 475

0476 X1=X2/(1-X3)
: GOTO 500

0480 INPUT "DO YOU WISH TO SPECIFY THE NUMBER OF ENROLLMENTS. (Y/N)",A0$
: IF A0$<>"Y" AND A0$<>"N" THEN 480
: IF A0$="N" THEN 490
0485 PRINT "ENTER NUMBER OF INPUTS (ENROLLMENTS)":X1
: INPUT X1
: ERROR PRINT HEX(070C0C)
: GOTO 485

0487 X2=X1*(1-X3)
: GOTO 500

0490 SELECT P4
: FOR H=1 TO 10
: PRINT HEX(03)
: PRINT HEX(07)
: PRINT " NO-NO, YOU MUST INPUT EITHER WORK UNITS. GRADUATES OR ENROLLMENTS.
TRY AGAIN"
: NEXT H
: SELECT P0
: PRINT HEX(03)
: GOTO 452

0500 W2=(B(44)*X2+7*X7*X3*X1+X5*X6*B(44)*X2)/30
: W3=W2-W1
: R3=W3+B(60)
: GOTO 520

0510 INPUT "ENTER REVISED WORK UNITS FOR THAT COURSE".R3
: ERROR PRINT HEX(070C)
: GOTO 510

0515 X8=(30*R3/(B(44)+7*X7*X3/(1-X3)+X5*X6*B(44)))-(30*B(60)/(B(44)+7*X7*X3/(1-X
3)+X5*X6*B(44)))
: X2=B(43)+X8
: X1=X2/(1-X3)
0520 R3(I)=R3
: I3=R3-B(60)
: W(I)=B(60)
: D1$(I)=STR(B1$,12,2)
: D2$(I)=STR(B1$,14,2)
0530 IF A4$="N" THEN 570
: INPUT "WOULD YOU LIKE TO CHANGE THE ORIGINAL COST DATA FOR THIS COURSE (Y/
N)",A1$
: IF A1$<>"Y" AND A1$<>"N" THEN 530
: IF A1$="N" THEN 570
: PRINT HEX(0A0A)
0540 PRINT HEX(0C0C)
: PRINT "ENTER THE SUBSCRIPT OF THE DATA CELL YOU WISH TO CHANGE.
: INPUT "IF NO MORE, ENTER 0",N
: ERROR PRINT HEX(07)
: GOTO 540

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0542 IF N<>ABS(INT(N))THEN 540
      : IF N<0 OR N>41 THEN 540
0545 IF N=0THEN 570
      : PRINTUSING 550,N,B(N)
0550 %      PRESENT VALUE FOR CELL ** = *.***.***.***.***
0560 INPUT "ENTER REPLACEMENT VALUE (NO COMMAS OR DECIMAL)".B(11)
      : ERROR PRINT HEX(070C)
      : GOTO 545

0565 PRINT HEX(030A0A0A0A)
      : GOTO 540

0570 C5=1
      : IF C5#="Y" THEN GOSUB / 90
      : C5=0
      : MAT F1=ZER
      : MAT V=ZER
      : FOR L=1 TO 9
      : IF L>2 AND L<8 THEN GOTO 579
0571 IF P1>F(L,1) THEN 572
      : P=1
      : GOTO 578

0572 IF P1<F(L,2) THEN 574
      : P=0
      : GOTO 578

0574 P0=P1-F(L,1)
      : P3=F(L,2)-F(L,1)
      : P=1-P0/P3
0578 F1(L)=B(L)*P
      : V(L)=B(L)-F1(L)
0579 NEXT L
      : FOR L=3TO 41
      : IF L=8OR L=9THEN 821
      : IF R3=0THEN 821
      : IF B(L)=0THEN 821
0580 IF P1>F(L,1)THEN 600
0590 P=1
      : GOTO 630

0600 IF P1<F(L,2)THEN 620
0610 P=0
      : GOTO 630

0620 P0=P1-F(L,1)
      : P3=F(L,2)-F(L,1)
      : P=1-P0/P3
0630 F1=P*B(L)
      : F1(L)=F1
      : F1(46)=F1(46)+F1(L)
      : V=B(L)-F1
      : V(L)=V
      : V(46)=V(46)+V(L)
0640 F0=F1/R3
      : V0=V/B(60)
      : C0(L)=F0+V0
      : V2=V0
0650 SELECT PRINT <P0*>(130)
      : IF V0=0THEN 820

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      : IF L>38AND L<42THEN 820
0660 IF Z$="G"THEN 780
0665 IF A7$="Y" THEN 780
0670 IF R$(L)="P"THEN 700
0680 IF R$(L)="E"THEN 710
0690 IF R$(L)="S"THEN 720
      : GOTO 780

0700 C1=P2*F2*B(44)
      : GOTO 730

0710 C1=E2*F2*B(44)
      : GOTO 730

0720 C1=S2*F2*B(44)
0730 IF C1=0THEN 780
      : C1=C1/30
      : W4=(B(60)-C1)/((B(60)+C1)/2)
      : IF W4>1THEN W4=1
      : IF W4<-.5THEN W4=-.5
      : SELECT PRINT 005(80)
      : PRINT "FOR CELL # ";L;" , THIS COURSE IS CURRENTLY OPERATING AT"
      : PRINT 100*(1+W4);" PERCENT OF ITS RELATED CAPACITY"
      : FOR M=1 TO 10000
      : NEXT M
      : PRINT HEX(0A)
0740 IF W4<=1AND W4>=-.5THEN 760
      : SELECT PRINT 005(80)
      : PRINT HEX(030A0A0A0A)
      : PRINT "CAUTION !!! PRESENT WORK UNITS DEVIATE FROM CAPACITY"
      : PRINT "BY MORE THEN MODEL TOLERANCES FOR CELL ";L
      : PRINT "REVISED AVERAGE COSTS HAVE BEEN CONSTRAINED"
      : PRINT "BETWEEN 50% AND 200% OF PRESENT AVERAGE COSTS"
      : GOTO 760

0750 C0(L)=F1/R3
      : GOTO 780

0760 A1=C0(L)*(1+W4)
      : W9=F1/A1
      : IF R3<=W9THEN 750
      : C0(L)=A1
      : GOTO 780

0780 IF A2$="Y" THEN 820
      : Y=L1(L,1)+L1(L,3)*B(47)+L1(L,2)*B(60)
0790 Y1=L1(L,1)+L1(L,3)*B(47)+L1(L,2)*R3
0800 A0=2*(Y-Y1)/(Y+Y1)
      : W0=2*(B(60)-R3)/(B(60)+R3)
      : IF W0=0 THEN 820
      : IF ABS(A0/W0)<=1THEN 810
0805 SELECT P5
      : FOR M=1 TO 5
      : PRINT HEX(03)
      : PRINT AT(5,5);"WARNING!!! COEFFICIENTS CHOSEN TO MAKE SCALE ADJUSTMENTS";AT
      : (7,5);"ARE WRONG. THE COEFFICIENTS CHOSEN REFLECT";AT(9,5);"UNACCEPTABLE E
      : CONOMIES OF SCALE. SCALE ADJUSTMENTS WERE OMITTED."
      : PRINT HEX(03)
      : NEXT M
      : GOTO 820

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0810 V2=V0*((2-A0)/(2+A0))
0820 C0(L)=C0(L)+(V2-V0)
      : C0(L)=C0(L)*R3
0821 NEXT L
      : F1(42)=B(42)
      : F1(43)=B(43)
      : F1(44)=B(44)
      : F1(45)=B(45)
      : F1(60)=B(60)
      : IF C5$="Y" THEN GOSUB ' 95
      : C0(60)=R3
      : Z$=" "
0823 IF A7$="Y" THEN 825
      : SELECT PRINT 005(80)
      : PRINT "CHECK CAPACITIES AND PRESS ANY KEY TO CONTINUE"
      : KEYIN Z0$
0825 SELECT PRINT 005(80)
      : PRINT HEX(03);STR(B1$,22,11);"          RMS ":STR(B1$,8,4):"          D.CODE
      : STR(B1$,12,7)
      : PRINT
      : PRINT "COURSE ";N2$;"          DIV.":D2$(I):"          DEPT. ":D1$(I):"          UIC ":U1$
0830 SELECT PRINT <P0$>(130)
      : IF A5$="Y" THEN 841
      : SELECT PRINT 005(80)
      : PRINT HEX(03)
0841 PRINT HEX(0E)
      : PRINT STR(B1$,22,11);"          RMS ":STR(B1$,8,4):"          DISTR.CODE ":STR(B1$,12,7)
      : PRINT HEX(0A0E)
      : PRINT "COURSE ";N2$;"          DIV.":D2$(I):"          DEPT.":D1$(I):"          UIC ":U1$

      : GOSUB '10
0850 IF A5$="Y" THEN 860
      : SELECT PRINT 005(80)
0860 PRINT "END OF DATA FOR COURSE ":N2$
      : FOR M=1 TO 10000
      : NEXT M
      : IF A5$="N" THEN 880
0870 PRINT "=====
      : =====
0880 GOSUB '239(2)
0890 IF A8$="I" THEN 895
      : R4=0
      : R5=0
0895 MAT C0=ZER
      : MAT R=ZER
      : NEXT I
0900 M=1
0910 MAT SORTU1$() TO W$,G$()
0920 MAT MOVE U1$(),G$() TO U$()
0930 FOR O=1 TO N1
      : G(O)=VAL(G$(O),2)
      : NEXT O
0950 FOR I=1 TO N1
      : K=G(I)
      : S1(M)=S1(M)+W(K)
      : S2(M)=S2(M)+R3(K)
      : C(M)=C(M)+1
0960 IF I=N1 THEN 980

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      : IF U$(I)=U$(I+1) THEN 980
0970 M=M+1
0980 NEXT I
0990 SELECT PRINT 005(80)
      : PRINT HEX(03)
      : PRINT "      *** ACTIVITY LEVEL ESTIMATION ***"
      : A8$=" "
      : R4=0
      : R5=0
1010 PRINT "ENTER AVERAGE ANNUAL MILITARY PAY (ACTIVITY LEVEL) FOR THE YEAR"
      : PRINT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS"
      : INPUT "FOR DATA BASE COMPUTATION HIT RETURN".R4
      : ERROR PRINT HEX(070C0C)
      : GOTO 1010

1015 IF R4=0 THEN 1030
      : A8$="I"
1020 PRINT "ENTER AVERAGE ANNUAL CIVILIAN PAY (ACTIVITY LEVEL) FOR THE YEAR"
      : INPUT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS".R5
      : ERROR PRINT HEX(070C)
      : GOTO 1020

1030 DATA LOAD DC #1,F2(),R2$(),L2()
      : R4=0
1040 FOR I=1 TO N1
      : K=G(I)
      : IF S1(I)=0 THEN 1380
1050 STR(U$,1,4)=STR(U$(I),1,4)
      : STR(U$,5,2)="F1"
      : STR(U$,7,1)=STR(U$(I),5,1)
1060 GOSUB 230(2,5,6,2,U$)
1070 IF Q$<>" " THEN GOSUB 4160
1080 GOSUB 235(2)
1090 IF Q$<>" " THEN 4220
1100 DATA LOAD DC #6,B1$,B2$,B$()
1110 GOSUB 35
1125 SELECT PRINT 005(80)
      : PRINT HEX(03);STR(B2$,1,22);"      RMS ":STR(B1$.8,4);"      D.CODE ";STR(
      B1$,12,7)
      : PRINT
      : PRINT "      UIC ";U$(I)
      : PRINT HEX(0A)
1130 IF A4$="N" THEN 1160
      : PRINT HEX(0C)
      : INPUT "WOULD YOU LIKE TO CHANGE THE ORIGINAL COST DATA FOR THIS ACTIVITY (Y
      /N)",A1$
      : IF A1$<>"Y" AND A1$<>"N" THEN 1130
      : IF A1$="N" THEN 1160
      : PRINT HEX(0A0A)
1140 PRINT HEX(0C0C)
      : PRINT "ENTER THE SUBSCRIPT OF THE DATA CELL YOU WISH TO CHANGE."
      : INPUT "IF NO MORE,ENTER 0",N
      : ERROR PRINT HEX(07)
      : GOTO 1140

1142 IF N<>ABS(INT(N)) THEN 1140
      : IF N<0 OR N>60 THEN 1140
1145 IF N=0 THEN 1160
      : PRINT USING 550,N,B(N)
1150 INPUT "ENTER REPLACEMENT VALUE (NO COMMAS OR DECIMAL)".B(N)

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      : ERROR PRINT HEX(070C)
      : GOTO 1150

1155 GOTO 1140

1160 I3=S2(I)-S1(I)
      : IF C5#="Y" THEN GOSUB ' 90
      : MAT F1=ZER
      : MAT V=ZER
      : FOR L=1 TO 9
      : IF L>2 AND L<8 THEN GOTO 1169
1161 IF P1>F(L,1) THEN 1162
      : P=1
      : GOTO 1168

1162 IF P1<F(L,2) THEN 1164
      : P=0
      : GOTO 1168

1164 P0=P1-F(L,1)
      : P3=F(L,2)-F(L,1)
      : P=1-P0/P3
1168 F1(L)=B(L)*P
      : V(L)=B(L)-F1(L)
1169 NEXT L
      : FOR L=3 TO 41
      : IF L=8 OR L=9 THEN 1315
      : IF B(L)=0 THEN 1315
      : IF I3<>0 THEN 1170
      : C0(L)=B(L)
      : GOTO 1315

1170 IF P1>F2(L,1) THEN 1190
1180 P=1
      : GOTO 1220

1190 IF P1<F2(L,2) THEN 1210
1200 P=0
      : GOTO 1220

1210 P0=P1-F2(L,1)
      : P3=F2(L,2)-F2(L,1)
      : P=1-P0/P3
1220 F1=P*B(L)
      : F1(L)=F1
      : F1(46)=F1(46)+F1(L)
      : V=B(L)-F1
      : V(L)=V
      : V(46)=V(46)+V(L)
1230 F0=F1/(B(60)+(S2(I)-S1(I)))
1240 V0=V/B(60)
      : C0(L)=F0+V0
      : V2=V0
1250 IF V0=0 THEN 1310
1270 IF A2#="Y" THEN 1310
      : Y=L2(L,1)+L2(L,2)*B(60)
1280 Y1=L2(L,1)+L2(L,2)*(B(60)+S2(I)-S1(I))
1290 A0=2*(Y-Y1)/(Y+Y1)
      : W0=2*I3/(B(60)+B(60)+I3)
      : IF ABS(A0/W0)<=1 THEN 1300

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1295 SELECT P5
: FOR M=1 TO 5
: PRINT HEX(03)
: PRINT AT(5,5);"WARNING!!! COEFFICIENTS CHOSEN TO MAKE SCALE ADJUSTMENTS";AT
(7,5);"ARE WRONG. THE COEFFICIENTS CHOSEN REFLECT";AT(9,5);"UNACCEPTABLE F
CONOMIES OF SCALE. SCALE ADJUSTMENTS WERE OMITTED."
: PRINT HEX(03)
: NEXT M
: GOTO 1310

1300 V2= (2-A0)/(2+A0))
1310 C0( )=C0(L)+(V2-V0)
: C0( )=C0(L)*(B(60)+I3)
1315 HEX
: F1(4)=B(42)
: F1(43)=B(43)
: F1(44)=B(44)
: F1(45)=B(45)
: F1(60)=B(60)
: IF C5$="Y" THEN GOSUB ' 95
: C0(60)=B(60)+I3
1320 SELECT PRINT <P0$>(130)
: IF A5$="Y" THEN 1330
: SELECT PRINT 005(80)
: PRINT HEX(03)
1330 X4=X4+1
: IF C(X4)=0 THEN 1330
1331 PRINT HEX(0E);STR(B2$,1,22);" RMS ":STR(B1$.8,4);" D.CODE ":STR(R
1$,12,7)
: PRINT HEX(0A0E)
: PRINT "ACTIVITY UIC ";U$(I);" COURSES INVOLVED =":C(X4)
: GOSUB '10
1340 IF A5$="Y" THEN 1350
: SELECT PRINT 005(80)
1350 PRINT "END OF DATA FOR ACTIVITY ";U$(I)
: FOR M=1 TO 10000
: NEXT M
: IF A5$="N" THEN 1370
1360 PRINT "=====
=====
1370 GOSUB '239(2)
1375 GOSUB '25
1380 IF A8$="I" THEN 1385
: R4=0
: R5=0
1385 MAT C0=ZER
: MAT R=ZER
: NEXT I
1390 FOR L=1 TO N1
: STR(X1$(L),1,5)=U1$(L)
: STR(X1$(L),6,2)=D1$(L)
: NEXT L
1400 INIT(00)G$( ),W$
: MAT G=ZER
: MAT S1=ZER
: MAT S2=ZER
: MAT SORTX1$( ) TO W$,G$( )
1410 MAT MOVE X1$( )(6,2),G$( ) TO D$( )
1430 FOR O=1 TO N1
: G(O)=VAL(G$(O),2)

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: NEXT D
1440 MAT C=ZER
: M=1
: FOR I=1 TO N1
: K=G(I)
: S1(M)=S1(M)+W(K)
: S2(M)=S2(M)+R3(K)
: C(M)=C(M)+1
1450 IF I=N1 THEN 1490
1470 IF U$(I)=U$(I+1) AND D$(I)=D$(I+1) THEN 1490
1480 M=I+1
1490 NEXT I
1500 SELECT PRINT 005(80)
: PRINT HEX(03)
: PRINT " *** DEPARTMENT LEVEL ESTIMATION ***"
: AB$=" "
: R4=0
: R5=0
1520 PRINT "ENTER AVERAGE ANNUAL MILITARY PAY (DEPARTMENT LEVEL) FOR THE YEAR"
: PRINT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS"
: INPUT "FOR DATA BASE COMPUTATION HIT RETURN".R4
: ERROR PRINT HEX(070C0C)
: GOTO 1520

1525 IF R4=0 THEN 1535
: AB$="I"
1530 PRINT "ENTER AVERAGE ANNUAL CIVILIAN PAY (DEPARTMENT LEVEL) FOR THE YEAR"
: INPUT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS".R5
: ERROR PRINT HEX(070C)
: GOTO 1530

1535 DATA LOAD DC #1,F3(),R3$(),L3()
: X4=0
1540 FOR I=1 TO N1
: K=G(I)
: IF S1(I)=0 THEN 1930
1550 STR(U$,1,4)=STR(U$(I),1,4)
: STR(U$,5,2)="F1"
: STR(U$,7,1)=STR(U$(I),5,1)
1560 GOSUB '230(2,5,6,2,U$)
1570 IF Q$<>" " THEN GOSUB 4180
1580 GOSUB '235(2)
1590 IF Q$<>" " THEN 4220
1600 GOSUB '237(2)
1610 IF Q$<>"E" THEN 1620
: SELECT P9
: PRINT "THERE IS NO DEPARTMENT RECORD FOR DEPT.#":K
: SELECT P0
: GOTO 1920

1620 IF Q$<>" " THEN 4200
1630 DATA LOAD DC #6,B1$,B2$,B$()
1640 IF STR(B1$,12,2)<>D1$(K) THEN 1600
: IF STR(B1$,16,1)<>"3" THEN 1600
1650 GOSUB '35
1655 SELECT PRINT 005(80)
: PRINT HEX(03);STR(B1$,22,11);" RMS ":STR(B1$.8,4):"
(B1$,12,7)
: PRINT
: PRINT " DEPT ":D$(I);" UIC ":U$(I)

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1660 IF A4$="N" THEN 1690
      : INPUT "WOULD YOU LIKE TO CHANGE THE ORIGINAL COST DATA FOR THIS DEPARTMENT
      (Y/N)", A1$
      : IF A1$ <> "Y" AND A1$ <> "N" THEN 1660
      : IF A1$="N" THEN 1690
      : PRINT HEX(0A0A)
1670 PRINT HEX(0C0C)
      : PRINT "ENTER THE SUBSCRIPT OF THE DATA CELL YOU WISH TO CHANGE."
      : INPUT "IF NO MORE, ENTER 0", N
      : ERROR PRINT HEX(07)
      : GOTO 1670

1672 IF N <> ABS(INT(N)) THEN 1670
      : IF N < 0 OR N > 60 THEN 1670
1675 IF N=0 THEN 570
      : PRINT USING 550, N, B(N)
1680 INPUT "ENTER REPLACEMENT VALUE (NO COMMAS OR DECIMAL)", B(N)
      : ERROR PRINT HEX(070C)
      : GOTO 1680

1685 GOTO 1670

1690 I3=S2(I)-S1(I)
      : IF C5$="Y" THEN GOSUB ' 30
      : MAT F1=ZER
      : MAT V=ZER
      : FOR L=1 TO 9
      : IF L>2 AND L<8 THEN GOTO 1699
1691 IF P1>F(L,1) THEN 1692
      : P=1
      : GOTO 1698

1692 IF P1<F(L,2) THEN 1694
      : P=0
      : GOTO 1698

1694 P0=P1-F(L,1)
      : P3=F(L,2)-F(L,1)
      : P=1-P0/P3
1698 F1(L)=B(L)*P
      : V(L)=B(L)-F1(L)
1699 NEXT L
      : FOR L=3 TO 41
      : IF L=8 OR L=9 THEN 1865
      : IF B(L)=0 THEN 1865
      : IF I3<>0 THEN 1710
      : C0(L)=B(L)
      : GOTO 1865

1710 IF P1>F3(L,1) THEN 1730
1720 P=1
      : GOTO 1760

1730 IF P1<F3(L,2) THEN 1750
1740 P=0
      : GOTO 1760

1750 P0=P1-F3(L,1)
      : P3=F3(L,2)-F3(L,1)
      : P=1-P0/P3

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1760 F1=P*B(L)
      : F1(L)=F1
      : F1(46)=F1(46)+F1(L)
      : V=B(L)-F1
      : V(L)=V
      : V(46)=V(46)+V(L)
1770 F0=F1/(B(60)+I3)
1790 V0=V/B(60)
      : C0(L)=F0+V0
      : V2=V0
1800 IF V0=0 THEN 1860
1820 IF A2$="Y" THEN 1860
      : Y=L3(L,1)+L3(L,2)*B(60)
1830 Y1=L3(L,1)+L3(L,2)*(B(60)+I3)
1840 A0=2*(Y-Y1)/(Y+Y1)
      : W0=2*I3/(B(60)+B(60)+I3)
      : IF ABS(A0/W0)<=1 THEN 1850
1845 SELECT P5
      : FOR M=1 TO 5
      : PRINT HEX(03)
      : PRINT AT(5,5);"WARNING!!! COEFFICIENTS CHOSEN TO MAKE SCALE ADJUSTMENTS";AT
      : (7,5);"ARE WRONG. THE COEFFICIENTS CHOSEN REFLECT";AT(9,5);"UNACCEPTABLE E
      : CONOMIES OF SCALE. SCALE ADJUSTMENTS WERE OMITTED."
      : PRINT HEX(03)
      : NEXT M
      : GOTO 1860

1850 V2=V0*((2-A0)/(2+A0))
1860 C0(L)=C0(L)+(V2-V0)
      : C0(L)=C0(L)*(B(60)+I3)
1865 NEXT L
      : F1(42)=B(42)
      : F1(43)=B(43)
      : F1(44)=B(44)
      : F1(45)=B(45)
      : F1(60)=B(60)
      : IF C5$="Y" THEN GOSUB ' 95
      : C0(60)=B(60)+I3
1870 SELECT PRINT <P0$>(130)
      : IF A5$="Y" THEN 1880
      : SELECT PRINT 005(80)
      : PRINT HEX(03)
1880 X4=X4+1
      : IF C(X4)=0 THEN 1880
1881 PRINT HEX(0E);STR(B1$,22,11);"          RMS ":STR(B1$,8,4);"          D.CODE ";STR(
      : B1$,12,7)
      : PRINT HEX(0A0E)
      : PRINT "DEPARTMENT ";D$(I);"          UIC":U$(I).C(X4);" COURSES"
      : GOSUB '10
1890 IF A5$="Y" THEN 1900
      : SELECT PRINT 005(80)
1900 PRINT "END OF DATA FOR DEPARTMENT ";D$(I)
      : FOR M=1 TO 10000
      : NEXT M
      : IF A5$="N" THEN 1920
1910 PRINT "=====
      : ====="
1920 GOSUB '239(2)
1930 IF A8$="I" THEN 1935
      : R4=0

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      : R5=0
1935 MAT C0=ZER
      : MAT R=ZER
      : NEXT I
1940 FOR L=1TO N1
      : STR(X$(L),1,5)=U1$(L)
      : STR(X$(L),6,2)=D1$(L)
      : STR(X$(L),8,2)=D2$(L)
      : NEXT L
1950 INIT(00)G$( ),W$
      : MAT G=ZER
      : MAT S1=ZER
      : MAT S2=ZER
      : MAT SORTX$( )TO W$,G$( )
      : MAT MOVE X$( )(8,2),G$( )TO D0$( )
1960 FOR O=1TO N1
      : G(O)=VAL(G$(O),2)
      : NEXT O
1970 MAT C=ZER
      : M=1
      : FOR I=1TO N1
      : K=G(I)
      : S1(M)=S1(M)+W(K)
      : S2(M)=S2(M)+R3(K)
      : C(M)=C(M)+1
1980 IF I=N1THEN 2020
1990 IF U$(I)=U$(I+1)AND D$(I)=D$(I+1)THEN 2000
      : GOTO 2010

2000 IF D0$(I)=D0$(I+1)THEN 2020
2010 M=I+1
2020 NEXT I
2030 SELECT PRINT 005(80)
      : PRINT HEX(03)
      : PRINT "      *** DIVISION LEVEL ESTIMATION ***"
      : A8$=" "
      : R4=0
      : R5=0
2050 PRINT "ENTER AVERAGE ANNUAL MILITARY PAY (DIVISION LEVEL) FOR THE YEAR"
      : PRINT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS"
      : INPUT "FOR DATA BASE COMPUTATION HIT RETURN".R4
      : ERROR PRINT HEX(070C0C)
      : GOTO 2050

2055 IF R4=0 THEN 2070
      : A8$="I"
2060 PRINT "ENTER AVERAGE ANNUAL CIVILIAN PAY (DIVISION LEVEL) FOR THE YEAR"
      : INPUT "BEING ESTIMATED. PAY SHOULD BE IN FUTURE DOLLARS".R5
      : ERROR PRINT HEX(070C)
      : GOTO 2060

2070 DATA LOAD DC #1,F4( ),R4$( ),L4( )
      : X4=0
2080 FOR I=1TO N1
      : K=G(I)
      : IF S1(I)=0THEN 2450
2085 STR(U$,1,4)=STR(U$(I),1,4)
      : STR(U$,5,2)="F1"
      : STR(U$,7,1)=STR(U$(I),5,1)
2090 GOSUB '230(2,5,6,2,U$)

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2100 IF Q$<>" " THEN GOSUB 4180
2110 GOSUB '235(2)
2120 IF Q$<>" " THEN 4220
2130 GOSUB '237(2)
2140 IF Q$<>"E" THEN 2150
      : SELECT P9
      : PRINT "THERE IS NO COST RECORD FOR DIVISION #":K
      : SELECT P0
      : GOTO 2440

2150 IF Q$<>" " THEN 4200
2160 DATA LOAD DC #6,B1$,B2$,B$()
2170 IF STR(B1$,12,2)<>D1$(K) THEN 2130
      : IF STR(B1$,14,2)<>D2$(K) THEN 2130
      : IF STR(B1$,16,1)<>"5" THEN 2130
2180 GOSUB '35
2185 SELECT PRINT 005(80)
      : PRINT HEX(03);STR(B1$,22,11);"          RMS ":STR(B1$.8,4);"          D.CODE ":STR(
        B1$,12,7)
      : PRINT
      : PRINT "          DIV.":D0$(I);"          DEPT ":D$(I);"          UIC ":U$(I)
      : PRINT HEX(0A)
2190 PRINT HEX(0C)
      : IF A4$="N" THEN 2220
      : INPUT "WOULD YOU LIKE TO CHANGE THE ORIGINAL COST DATA FOR THIS DIVISION
        Y/N)",A1$
      : IF A1$<>"Y" AND A1$<>"N" THEN 2190
      : IF A1$="N" THEN 2220
      : PRINT HEX(0A0A)
2200 PRINT HEX(0C0C)
      : PRINT "ENTER THE SUBSCRIPT OF THE DATA CELL YOU WISH TO CHANGE."
      : INPUT "IF NO MORE,ENTER 0",N
      : IF N=0 THEN 2220
      : ERROR PRINT HEX(07)
      : GOTO 2200

2202 IF N<>ABS(INT(N)) THEN 2200
      : IF N<0 OR N>60 THEN 2200
2205 IF N=0 THEN 2220
      : PRINT USING 550,N,B(N)
2210 INPUT "ENTER REPLACEMENT VALUE (NO COMMAS OR DECIMAL)".B(N)
      : ERROR PRINT HEX(070C)
      : GOTO 2210

2215 GOTO 2200

2220 I3=S2(I)-S1(I)
      : IF C5$="Y" THEN GOSUB 90
      : MAT F1=ZER
      : MAT V=ZER
      : FOR L=1 TO 9
      : IF L>2 AND L<8 THEN GOTO 2229
2221 IF P1>F(L,1) THEN 2222
      : P=1
      : GOTO 2228

2222 IF P1<F(L,2) THEN 2224
      : P=0
      : GOTO 2228

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2224 P0=P1-F(L,1)
      : P3=F(L,2)-F(L,1)
      : P=1-P0/P3
2226 F1(L)=B(L)*P
      : V(L)=B(L)-F1(L)
2229 NEXT L
      : FOR L=3 TO 41
      : IF L=8 OR L=9 THEN 2385
      : IF B(L)=0 THEN 2385
      : IF I3>0 THEN 2240
      : C0(L)=B(L)
      : GOTO 2385

2240 IF P1/F4(L,1) THEN 2260
2250 P=1
      : GOTO 2290

2260 IF P1/F4(L,2) THEN 2280
2270 P=0
      : GOTO 2290

2280 P0=P1-F4(L,1)
      : P3=F4(L,2)-F4(L,1)
      : P=1-P0/P3
2290 F1=P*B(L)
      : F1(L)=F1
      : F1(46)=F1(46)+F1(L)
      : V=B(L)-F1
      : V(L)=V
      : V(46)=V(46)+V(L)
2300 F0=F1/(B(60)+I3)
2310 V0=V/B(60)
      : C0(L)=F0+V0
      : V2=V0
2320 IF V0=0 THEN 2380
2340 IF A2$="Y" THEN 2380
      : Y=L4(L,1)+L4(L,2)*B(60)
2350 Y1=L4(L,1)+L4(L,2)*(B(60)+I3)
2360 A0=2*(Y-Y1)/(Y+Y1)
      : ERROR GOTO 2380
2365 W0=2*I3/(B(60)+B(60)+I3)
      : IF ABS(A0/W0)<=1 THEN 2370
2367 SELECT P5
      : FOR M=1 TO 5
      : PRINT HEX(03)
      : PRINT AT(5,5);"WARNING!!! COEFFICIENTS CHOSEN TO MAKE SCALE ADJUSTMENTS";AT
      : (7,5);"ARE WRONG. THE COEFFICIENTS CHOSEN REFLECT";AT(9,5);"UNACCEPTABLE E
      : CONOMIES OF SCALE. SCALE ADJUSTMENTS WERE OMITTED."
      : PRINT HEX(03)
      : NEXT M
      : GOTO 2380

2370 V2=V0*((2-A0)/(2+A0))
2380 C0(L)=C0(L)+(V2-V0)
      : C0(L)=C0(L)*R3
2385 NEXT L
      : F1(42)=B(42)
      : F1(43)=B(43)
      : F1(44)=B(44)
      : F1(45)=B(45)

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: F1(60)=B(60)
: IF C5$="Y" THEN GOSUB 95
: C0(60)=B(60)+I3
2390 M=0
: SELECT PRINT <P0$>(130)
: IF A5$="Y" THEN 2400
: SELECT PRINT 005(80)
: PRINT HEX(03)
2400 X4=X4+1
: IF C(X4)=0 THEN 2400
2401 PRINT HEX(0E);STR(B1$,22,11);"          RMS ":STR(B1$.8,4);"          D.CODE ":STR(
B1$,12,7)
: PRINT HEX(0A0E)
: PRINT "DIVISION ";D0$(I);"          DEPT. ":D$(I);"          UIC ":U$(I).C(X4);" COURSE
ES"
: GOSUB '10
2410 IF A5$="Y" THEN 2420
: SELECT PRINT 005(80)
2420 PRINT "END OF DATA FOR DIVISION ";D0$(I)
: FOR A2=1 TO 10000
: NEXT A2
: IF A5$="N" THEN 2440
2430 PRINT "=====
=====
2440 GOSUB '239(2)
2450 IF A8$="I" THEN 2455
: R4=0
: R5=0
2455 MAT C0=ZER
: MAT R=ZER
: NEXT I
2460 SELECT PRINT 005(80)
: PRINT "WOULD YOU LIKE A BREAKDOWN OF THE TOTAL COST CHANGES"
: INPUT "BY CATEGORY FOR EACH ACTIVITY (Y/N)".A1$
: IF A1$ <> "Y" AND A1$ <> "N" THEN 2460
2470 IF A1$="N" THEN 2541
2480 SELECT PRINT <P0$>(132)
: PRINT HEX(0C0E)
: PRINT "          ***** COST CHANGES BY ACTIVITY *****"
2490 FOR X=1 TO 60
: FOR J=1 TO 10
: IF A2(J,X) <> 0 THEN 2495
: NEXT J
: GOTO 2540
2495 PRINT "ACTIVITY ID=";K$(X)
: PRINT HEX(0A)
: PRINT USING 3935
: PRINT USING 3936
2500 PRINT USING 3940,A1(1,X),A1(1,X)+A2(1,X).A2(1,X)
: PRINT USING 3950,A1(2,X),A1(2,X)+A2(2,X).A2(2,X)
: PRINT USING 3960,A1(3,X),A1(3,X)+A2(3,X).A2(3,X)
: PRINT USING 3970,A1(4,X),A1(4,X)+A2(4,X).A2(4,X)
: PRINT USING 3980,A1(5,X),A1(5,X)+A2(5,X).A2(5,X)
: PRINT USING 3990,A1(6,X),A1(6,X)+A2(6,X).A2(6,X)
2505 PRINT USING 4000,A1(7,X),A1(7,X)+A2(7,X).A2(7,X)
: PRINT USING 4005,A1(8,X),A1(8,X)+A2(8,X).A2(8,X)
2506 PRINT USING 4006
: PRINT USING 4060,A1(3,X)+A1(4,X)+A1(5,X)+A1(6,X)+A1(7,X)+A1(8,X),A1(3,X)+A1(
4,X)+A1(5,X)+A1(6,X)+A1(7,X)+A1(8,X)+A2(3,X)+A2(4,X)+A2(5,X)+A2(6,X)+A2(7,X)+A2(8,X)

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      1+A2(8,X),A2(3,X)+A2(4,X)+A2(5,X)+A2(6,X)+A2(7,X)+A2(8,X)
: PRINT HEX(0A)
2510 PRINTUSING 4007
: PRINTUSING 4008
: PRINTUSING 4010,A1(3,X)+A1(8,X),A1(3,X)+A1(8,X)+A2(3,X)+A2(8,X),A2(3,X)+A2(
8,X)
: PRINTUSING 4020,A1(9,X),A1(9,X)+A2(9,X),A2(9,X)
2515 PRINTUSING 4030,A1(10,X),A1(10,X)+A2(10,X),A2(10,X)
: PRINTUSING 4006
: PRINTUSING 4060,A1(3,X)+A1(8,X)+A1(9,X)+A1(10,X),A1(3,X)+A1(8,X)+A2(3,X)+A2
(8,X)+A1(9,X)+A2(9,X)+A1(10,X)+A2(10,X),A2(3,X)+A2(8,X)+A2(9,X)+A2(10,X)
2520 PRINT HEX(0A)
: PRINT "=====
=====
2540 NEXT X
2541 FOR W=1 TO 10
: FOR H=1 TO 60
: O(2,W)=O(2,W)+A2(W,H)
: NEXT H
: NEXT W
2550 INPUT "WOULD YOU LIKE A BREAKDOWN OF THE OVERALL TOTAL COST CHANGES BY CATE
GORY (Y/N)",A6$
: IF A6$<>"Y" AND A6$<>"N" THEN 2550
2560 IF A6$="N" THEN 2630
2570 SELECT PRINT <P0$>(130)
: IF A1$="N" THEN 2575
: PRINT HEX(0C)
2575 PRINT HEX(0A0A0E),"      ***** TOTAL COST CHANGES BY CATEGORY      *****"
2580 PRINT HEX(0A)
: PRINTUSING 3935
: PRINTUSING 3936
: PRINTUSING 3940,O(1,1),O(1,1)+O(2,1),O(2,1)
: PRINTUSING 3950,O(1,2),O(1,2)+O(2,2),O(2,2)
: PRINTUSING 3960,O(1,3),O(1,3)+O(2,3),O(2,3)
: PRINTUSING 3970,O(1,4),O(1,4)+O(2,4),O(2,4)
: PRINTUSING 3980,O(1,5),O(1,5)+O(2,5),O(2,5)
: PRINTUSING 3990,O(1,6),O(1,6)+O(2,6),O(2,6)
2590 PRINTUSING 4000,O(1,7),O(1,7)+O(2,7),O(2,7)
: PRINTUSING 4005,O(1,8),O(1,8)+O(2,8),O(2,8)
: PRINTUSING 4006
: PRINTUSING 4060,O(1,3)+O(1,4)+O(1,5)+O(1,6)+O(1,7)+O(1,8),O(1,3)+O(1,4)+O(1
,5)+O(1,6)+O(1,7)+O(1,8)+O(2,3)+O(2,4)+O(2,5)+O(2,6)+O(2,7)+O(2,8),O(2,3)+O
(2,4)+O(2,5)+O(2,6)+O(2,7)+O(2,8)
2595 PRINT HEX(0A)
: PRINTUSING 4007
: PRINTUSING 4008
2600 PRINTUSING 4010,O(1,3)+O(1,8),O(1,3)+O(1,8)+O(2,3)+O(2,8),O(2,3)+O(2,8)
: PRINTUSING 4020,O(1,9),O(1,9)+O(2,9),O(2,9)
: PRINTUSING 4030,O(1,10),O(1,10)+O(2,10),O(2,10)
2605 PRINTUSING 4006
: PRINTUSING 4060,O(1,3)+O(1,8)+O(1,9)+O(1,10),O(1,3)+O(1,8)+O(2,3)+O(2,8)+O(
1,9)+O(2,9)+O(1,10)+O(2,10),O(2,3)+O(2,8)+O(2,9)+O(2,10)
2620 PRINT HEX(0A)
: PRINT "=====
=====
2630 GOSUB '239(1)
: COM CLEAR
: LOAD DC T#0,"COSTMENU"0,9999 DEG 100
2650 DEFFN'20

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2720 UNPACK(*****)STR(A$(Q),70,3)TO F2
2730 UNPACK(*****)STR(A$(Q),73,3)TO P2
2740 UNPACK(*****)STR(A$(Q),76,3)TO E2
2750 UNPACK(*****)STR(A$(Q),79,3)TO S2
2760 UNPACK(****.)STR(A$(Q),82,2)TO X3
2770 UNPACK(****.)STR(A$(Q),84,2)TO X5
2780 X3=X3/100
      : X5=X5/100
2790 C=VAL(STR(A$(Q),13,2),2)
2800 RETURN

2820 DEFFN'35
2830 J1=1
2840 FOR M=1TO 4
      : FOR E=1TO 71STEP 5
2850 UNPACK(+*****STR(B$(M),E,5)TO B(J1)
      : B(J1)=ABS(B(J1))
2860 J1=J1+1
      : NEXT E
      : NEXT M
2870 B(44)=.7*B(44)
2880 RETURN

2900 DEFFN'10
2910 R1,R2=0
      : IF B(1)=0AND B(8)=0THEN 2911
      : R1=2080*(B(3)+B(10))/(B(1)+B(8))
2911 IF B(2)=0AND B(9)=0THEN 2920
      : R2=2080*(B(4)+B(11))/(B(2)+B(9))
2920 FOR O=1 TO D1
      : R1=R1+(I1/12)*R1
      : NEXT O
2940 RESTORE LINE 2960
2950 FOR M=1TO 12
      : READ X
2960 DATA 3,10,15,17,21,23,25,31,30,36,39,41
2965 IF R4=0 THEN R4=R1
      : IF C0(X)=0THEN 3020
      : IF R4<>0 THEN 2970
2967 INPUT " INSUFFICIENT DATA. PLEASE ENTER ORIGINAL AVG. MILITARY PAY",R1
      : ERROR PRINT HEX(07030A0A0A0A)
      : GOTO 2967

2968 GOTO 2920

2970 B1=C0(X)/R1
      : IF A3$="Y"THEN 3000
      : IF B(X)<R4 THEN 3000
      : IF B1>0AND B1<1THEN 3010
2990 C0(X)=R4*ROUND(B1,0)
      : GOTO 3020

3000 C0(X)=R4*B1
      : GOTO 3020

3010 C0(X)=R4
3020 NEXT M
3025 FOR O=1 TO D1
      : R2=R2+(I2/12)*R2
      : NEXT O

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3030 FOR M=1 TO 3
: READ X
3035 IF R5=0 THEN R5=R2
: IF C0(X)=0 THEN 3100
: IF R5<>0 THEN 3050
3037 INPUT " INSUFFICIENT DATA. PLEASE ENTER ORIGINAL AVG. CIVILIAN PAY",R2
: ERROR PRINT HEX(07030A0A0A0A)
: GOTO 3037

3038 RESTORE LINE 3040
: GOTO 3025

3040 DATA 4,11,26
3050 B2=C0(X)/R2
: IF A3$="Y" THEN 3080
: IF B(X)<R5 THEN 3080
3060 IF B2>0 AND B2<1 THEN 3090
3070 C0(X)=R5*ROUND(B2,0)
: GOTO 3100

3080 C0(X)=R5*B2
: GOTO 3100

3090 C0(X)=R5
3100 NEXT M
3115 IF C0(60)<>0 THEN 3120
: C0(42)=0
: C0(43)=0
: C0(45)=0
: GOTO 3200

3120 IF B(43)=0 THEN 3130
: C0(43)=X2
: GOTO 3140

3130 C0(43)=0
3140 IF B(44)=0 THEN 3150
: C0(44)=B(44)
: GOTO 3160

3150 C0(44)=0
3160 B(44)=X9
: IF B(45)=0 THEN 3170
: C0(45)=X1*X3
: GOTO 3180

3170 C0(45)=0
3180 IF B(42)=0 THEN 3190
: C0(42)=X7*C0(45)
: GOTO 3200

3190 C0(42)=0
3200 FOR M=1 TO 12
: READ X
3220 DATA 3,10,15,17,21,23,25,31,30,36,39,41
3230 FOR O=1 TO P1+D3
: C0(X)=C0(X)+(I1/12*C0(X))
: B(X)=B(X)+(I1/12)*B(X)
3240 NEXT O
: NEXT M

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3250 FOR M=1TO 25
: READ X
3260 DATA 4,11,26,5,12,27,6,13,28,7,14,16,18,22,24,29,32,33,19,20,34,35,37,36,40

3270 FOR O=1TO P1+D3
: C0(X)=C0(X)+((I2/12)*C0(X))
: B(X)=B(X)+(I2/12)*B(X)
3280 NEXT O
: NEXT M
3300 FOR M=1TO 8STEP 7
: IF B(M)=0OR B(M+2)=0THEN 3310
: C0(M)=C0(M+2)/(B(M+2)/B(M))
: IF B(M+1)=0OR B(M+3)=0THEN 3320
: C0(M+1)=C0(M+3)/(B(M+3)/B(M+1))
: GOTO 3330

3310 C0(M)=0
: GOTO 3330

3320 C0(M+1)=0
3330 NEXT M
3335 SELECT PRINT 005(80)
: PRINT HEX(0A0A)
3337 PRINT HEX(07)
3340 PRINT HEX(0C0C)
: PRINT "FOR A SPOT CHECK, ENTER THE SUBSCRIPT OF THE COST CELL YOU WANT PRINTED."
: INPUT "IF NO MORE, ENTER 0",L
: ERROR PRINT HEX(07)
: GOTO 3340

3342 IF L<>ABS(INT(L)) THEN 3337
: IF L<0 OR L>60 THEN 3337
3345 IF L=0 THEN 3380
3350 SELECT PRINT 005(80)
3360 PRINTUSING "CURRENT VALUE = -#.###.###.###.##".B(L)
3370 PRINTUSING "REVISED VALUE = -#.###.###.###.##".C0(L)
: PRINT HEX(0C0C)
: GOTO 3340

3380 PRINT HEX(0A0A0A)
3390 PRINT HEX(0C)
: INPUT "WOULD YOU LIKE DIAGNOSTIC INFORMATION".A1$
: IF A1$<>"Y" AND A1$<>"N" THEN 3390
: IF A1$="Y"THEN GOSUB '40
: PRINT HEX(0A0A0A)
3400 PRINT HEX(0C0C)
: PRINT "DO YOU WANT TO OVERRIDE ANY CELL VALUE ESTIMATED"
: INPUT "FROM THIS MODEL (DIRECT INPUTS). Y/N ".A1$
: IF A1$<>"Y" AND A1$<>"N" THEN 3400
3410 IF A1$="N"THEN 3510
: PRINT HEX(0A0A)
3440 PRINT HEX(0C0C)
: PRINT "ENTER SUBSCRIPT OF CELL YOU WISH TO CHANGE"
: INPUT "IF NO MORE, ENTER 0",S
: ERROR PRINT HEX(07)
: GOTO 3440

3445 IF S<>ABS(INT(S)) THEN 3440
: IF S<0 OR S>60 THEN 3440

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3447 IF S=0 THEN 3510
3450 PRINT "FOR COST CELL #";S
3460 PRINTUSING "THE ORIGINAL VALUE WAS      -#.****.****.****.***".B(S)
3470 PRINTUSING "THE ESTIMATED VALUE IS NOW -#.****.****.****.***".C0(S)
3480 INPUT "ENTER REPLACEMENT VALUE (NO COMMAS OR DOLLAR SIGNS )".R
      : ERROR PRINT HEX(070C)
      : GOTO 3480

3490 C0(S)=R
      : PRINT " CHANGE COMPLETED"
      : FOR A2=1 TO 1000
      : NEXT A2
      : PRINT HEX(0C0C0C0C0C)
      : GOTO 3440

3510 FOR L=1 TO 60
      : I4(L)=C0(L)-B(L)
3520 NEXT L
3540 IF A5$="N" THEN 3720
3550 SELECT PRINT <P0$>(130)
      : PRINT HEX(0A0E)
      : PRINT "      ***** SUMMARY OF COST ESTIMATES      *****"
      : PRINT HEX(0A)
3560 PRINT "      SOURCE              CURRENT              REVISED !      SOURCE
      :              CURRENT              REVISED"
3562 PRINT "      =====              =====              ===== !      =====
      :              =====              ====="
3565 PRINT "      !"
3610 FOR N3=1 TO 24
      : N4=N3+24
      : N5=N4
      : IF N4=46 THEN N5=60
      : IF N3<3 OR N3=8 OR N3=9 THEN 3620
      : IF N3>17 THEN 3630
3615 PRINTUSING 3660,A0$(N3),N3,A9$(N3).B(N3).C0(N3).A0$(N4).N4.A9$(N4),B(N4),C0
      (N4)
      : GOTO 3640

3620 PRINTUSING 3650,A0$(N3),N3,A9$(N3).B(N3).C0(N3).A0$(N4).N4.A9$(N4),B(N4),C0
      (N4)
      : GOTO 3640

3630 IF N3>22 THEN 3635
      : PRINTUSING 3670,A0$(N3),N3,A9$(N3).B(N3).C0(N3).A0$(N4).N5.A9$(N4),B(N5),C0
      (N5)
      : GOTO 3640

3635 PRINTUSING 3680,A0$(N3),N3,A9$(N3).B(N3).C0(N3)
3640 NEXT N3
3650 %***** ** . ***** -#,***,*** HOURS-#.****.*** HOURS ! ***** ** . *****
      -$***,***,***.##-$***,***,***.##
3660 %***** ** . ***** -$***,***.***.##-$***.***.***.## ! ***** ** . *****
      -$***,***,***.##-$***,***,***.##
3670 %***** ** . ***** -$***,***.***.##-$***.***.***.## ! ***** ** . *****
      -***,***,***,***-***,***,***.##
3680 %***** ** . ***** -$***,***.***.##-$***.***.***.## !
3720 R(2,1)=I4(1)+I4(8)
      : R(2,2)=I4(2)+I4(9)
      : R(1,1)=B(1)+B(8)
      : R(1,2)=B(2)+B(9)

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3730 R(2,3)=I4(3)+I4(10)+I4(15)+I4(17)+I4(21)+I4(23)+I4(25)+I4(31)+I4(36)+I4(36)
      : R(1,3)=B(3)+B(10)+B(15)+B(17)+B(21)+B(23)+B(25)+B(31)+B(36)+B(36)
3750 R(2,4)=I4(4)+I4(11)+I4(26)
      : R(1,4)=B(4)+B(11)+B(26)
3760 R(2,5)=I4(5)+I4(12)+I4(27)
      : R(1,5)=B(5)+B(12)+B(27)
3770 R(2,6)=I4(6)+I4(13)+I4(28)
      : R(1,6)=B(6)+B(13)+B(28)
3780 R(2,7)=I4(7)+I4(14)+I4(16)+I4(18)+I4(22)+I4(24)+I4(29)+I4(32)+I4(33)+I4(19)
      : I4(20)+I4(34)+I4(35)+I4(37)+I4(38)+I4(40)
      : R(1,7)=B(7)+B(14)+B(16)+B(18)+B(22)+B(24)+B(29)+B(32)+B(33)+B(19)+B(20)+B(3
4)+B(35)+B(37)+B(38)+B(40)
3790 R(2,8)=I4(39)+I4(41)
      : R(1,8)=B(39)+B(41)
3800 R(2,9)=I4(4)+I4(11)+I4(26)+I4(5)+I4(12)+I4(27)+I4(6)+I4(13)+I4(28)+I4(7)+I4
(14)+I4(16)+I4(18)+I4(19)+I4(20)+I4(22)+I4(24)+I4(29)+I4(32)+I4(33)+I4(37)+
I4(38)+I4(40)
3805 R(1,9)=B(4)+B(11)+B(26)+B(5)+B(12)+B(27)+B(6)+B(13)+B(28)+B(7)+B(14)+B(16)+
B(18)+B(19)+B(20)+B(22)+B(24)+B(29)+B(32)+B(33)+B(37)+B(38)+B(40)
3807 R(1,10)=B(34)+B(35)
      : R(2,10)=I4(34)+I4(35)
3810 MAT SEARCHK$( ),=STR(B1$,3,5)TO K1$()STEP 5
3820 IF K1$(1)<>HEX(0000)THEN 3840
3830 STOP "UIC NOT FOUND IN UICLIST"
3840 A=INT(VAL(K1$(1),2)/5)+1
3850 FOR W=1TO 10
      : A2(W,A)=A2(W,A)+R(2,W)
      : NEXT W
3880 SELECT PRINT 005(80)
      : PRINT HEX(03)
      : IF A5$="N" THEN 4050
3890 SELECT PRINT <P0$>(130)
3900 PRINT HEX(0A0E)
      : PRINT "      ***** SUMMARY OF COSTS BY CATEGORY *****"
3910 PRINT HEX(0A)
      : PRINTUSING 3935
      : PRINTUSING 3936
3915 PRINTUSING 3940,R(1,1),R(1,1)+R(2,1),R(2,1)
      : PRINTUSING 3950,R(1,2),R(1,2)+R(2,2),R(2,2)
      : PRINTUSING 3960,R(1,3),R(1,3)+R(2,3),R(2,3)
      : PRINTUSING 3970,R(1,4),R(1,4)+R(2,4),R(2,4)
3920 PRINTUSING 3980,R(1,5),R(1,5)+R(2,5),R(2,5)
      : PRINTUSING 3990,R(1,6),R(1,6)+R(2,6),R(2,6)
      : PRINTUSING 4000,R(1,7),R(1,7)+R(2,7),R(2,7)
      : PRINTUSING 4005,R(1,8),R(1,8)+R(2,8),R(2,8)
      : PRINTUSING 4006
3925 PRINTUSING 4060,R(1,3)+R(1,4)+R(1,5)+R(1,6)+R(1,7)+R(1,8),R(1,3)+R(1,4)+R(1
,5)+R(1,6)+R(1,7)+R(1,8)+R(2,3)+R(2,4)+R(2,5)+R(2,6)+R(2,7)+R(2,8),R(2,3)+R
(2,4)+R(2,5)+R(2,6)+R(2,7)+R(2,8)
      : PRINT HEX(0A)
      : PRINTUSING 4007
      : PRINTUSING 4008
3930 PRINTUSING 4010,R(1,3)+R(1,8),R(1,3)+R(2,3)+R(1,8)+R(2,8),R(2,3)+R(2,8)
      : PRINTUSING 4020,R(1,9),R(1,9)+R(2,9),R(2,9)
      : PRINTUSING 4030,R(1,10),R(1,10)+R(2,10),R(2,10)
3931 PRINTUSING 4006
      : PRINTUSING 4060,R(1,3)+R(1,8)+R(1,9)+B(34)+B(35),R(1,3)+R(2,3)+R(1,8)+R(2,8
)+P(1,9)+R(2,9)+C0(34)+C0(35),R(2,3)+R(2,8)+R(2,9)+I4(34)+I4(35)
4035 %RESOURCE TYPE          CURRENT COSTS          REVISED COSTS

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```

CHANGE
3936 %=====
=====
3940 %MIL HOURS          -*,***.***.***          -*,***.***.***
      +*,***,***,***
3950 %CIV HOURS          -*,***.***.***          -*,***.***.***
      +*,***,***,***
3960 %MIL LABOR COSTS    -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
3970 %CIV LABOR COSTS    -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
3980 %SUPPLIES           -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
3990 %CONTRACT           -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4000 %MISC               -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4005 %STUDENT P&L        -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4006 %-----
-----
4007 %FUNDING
4008 %=====
4010 %MPN                -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4020 %O&MN               -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4030 %OTHER              -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4040 PRINT HEX(0A)
4050 IF X$<>"PASSWORD"THEN 4055
      : INPUT "WOULD YOU LIKE TO SAVE THESE REVISED COSTS IN THE DATA BASE ?",A9$
      : IF A9$<>"Y" AND A9$<>"N" THEN 4050
      : IF A9$<>"Y" THEN 4055
      : GOSUB '100
4055 RETURN

4060 %TOTALS             -$,***.***.***.***    -$,***.***.***.***
      +$,***,***,***.***
4160 GOSUB '239(2)
      : IF Q$<>" " THEN 4165
      : GOSUB '230(2,5,6,2,U$)
      : IF Q$=" " THEN 4167
4165 PRINT "ERROR IN OPENING PERCAP FILE: TRY ANOTHER RUN..."
      : FOR H=1 TO 10000
      : NEXT H
      : GOSUB ' 15
4167 RETURN

4170 PRINT "THAT CDP IS NOT IN COURSE FILE. PLEASE CHECK IT AND RE-ENTER"
      : FOR H=1 TO 10000
      : NEXT H
      : LOAD DC T#0,"ECON"0,7999 BEG 248

4180 GOSUB '239(2)
      : IF Q$<>" " THEN 4185
      : GOSUB ' 230(2,5,6,1,U$)
      : IF Q$=" " THEN 4187
4185 PRINT "ERROR IN OPENING PERCAP FILE: TRY ANOTHER RUN..."
      : FOR H=1 TO 10000

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: NEXT H
: GOSUB ' 15
4187 RETURN

4190 PRINT "IMPROPER CALL TO KFAM FINDOLD: TRY ANOTHER RUN..."
: FOR H=1 TO 10000
: NEXT H
: GOSUB '15
4200 PRINT "IMPROPER CALL TO KFAM FINDNEXT: TRY ANOTHER RUN..."
: FOR H=1 TO 10000
: NEXT H
: GOSUB ' 15
4220 PRINT "IMPROPER CALL TO KFAM FINDFIRST: TRY ANOTHER RUN..."
: FOR H=1 TO 10000
: NEXT H
: GOSUB ' 15
4240 DEFFN'40
4250 PRINT HEX(03)
: PRINT "      ***  DIAGNOSTICS  ***"
: PRINT
: PRINT "AVAILABLE DATA AT THIS POINT"
: PRINT
: PRINT "CURRENT WORK UNITS ";B(60)
4260 PRINTUSING "AVERAGE MILITARY PAY      $###.###.##  ".R1
: PRINTUSING "AVERAGE CIVILIAN PAY      $###.###.##".R2
: RETURN

4270 DEFFN'25
: GOSUB ' 230 (2,5,6,1,U$)
4280 GOSUB '235(2)
: IF Q$<>" "THEN 4220
: GOTO 4290

4285 GOSUB '237(2)
: IF Q$="E"THEN 5000
: IF Q$<>" "THEN 4200
4290 DATA LOAD DC #6,B1$,B2$,B$( )
: GOSUB ' 35
4300 A1(1,A)=A1(1,A)+B(1)+B(8)
: A1(2,A)=A1(2,A)+B(2)+B(9)
: A1(3,A)=A1(3,A)+B(3)+B(10)+B(15)+B(17)+B(21)+B(23)+B(25)+B(31)+B(30)+B(36)
: A1(4,A)=A1(4,A)+B(4)+B(11)+B(26)
: A1(5,A)=A1(5,A)+B(5)+B(12)+B(27)
: A1(6,A)=A1(6,A)+B(6)+B(13)+B(28)
4310 A1(7,A)=A1(7,A)+B(7)+B(14)+B(16)+B(18)+B(22)+B(24)+B(29)+B(32)+B(33)+B(19)+
: B(20)+B(34)+B(35)+B(37)+B(38)+B(40)
: A1(8,A)=A1(8,A)+B(39)+B(41)
: A1(10,A)=A1(10,A)+B(34)+B(35)
4320 A1(9,A)=A1(9,A)+B(4)+B(11)+B(26)+B(5)+B(12)+B(27)+B(6)+B(13)+B(28)+B(7)+B(1
: 4)+B(16)+B(18)+B(19)+B(20)+B(22)+B(24)+B(29)+B(32)+B(33)+B(37)+B(38)+B(40)
4400 O(1,1)=O(1,1)+B(1)+B(8)
: O(1,2)=O(1,2)+B(2)+B(9)
: O(1,3)=O(1,3)+B(3)+B(10)+B(15)+B(17)+B(21)+B(23)+B(25)+B(31)+B(30)+B(36)
: O(1,4)=O(1,4)+B(4)+B(11)+B(26)
: O(1,5)=O(1,5)+B(5)+B(12)+B(27)
: O(1,6)=O(1,6)+B(6)+B(13)+B(28)
4410 O(1,7)=O(1,7)+B(7)+B(14)+B(16)+B(18)+B(22)+B(24)+B(29)+B(32)+B(33)+B(19)+B(
: 20)+B(34)+B(35)+B(37)+B(38)+B(40)
: O(1,8)=O(1,8)+B(39)+B(41)
: O(1,10)=O(1,10)+B(34)+B(35)

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4420 D(1,9)=D(1,9)+B(4)+B(11)+B(26)+B(5)+B(12)+B(27)+B(6)+B(13)+B(28)+B(7)+B(14)
      +B(16)+B(18)+B(19)+B(20)+B(22)+B(24)+B(29)+B(32)+B(33)+B(37)+B(38)+B(40)
4999 GOTO 4205

5000 RETURN

5010 DEFFN '100
      : REM   PACK AND SAVE REVISED COSTS
5020 C0(44)=C0(44)/.7
      : J1=1
      : FOR M=1 TO 4
      : FOR E=1 TO 71 STEP 5
      : IF C0(J1)<0 THEN C0(J1)=0
5030 PACK (+******) STR(B*(M),E,5) FROM C0(J1)
      : NEXT E
      : NEXT M
5040 DBACKSPACE #6,1
      : DATA SAVE DC #6,B1*,B2*,B*()
5050 RETURN

5060 DEFFN '15
      : GOSUB '239(1)
      : GOSUB '239(2)
      : RETURN CLEAR ALL

      : COM CLEAR
      : LOAD DC T#0,"COSTMENU"0,9999 BEG 100

5070 DEFFN '90
      : SELECT PRINT <P0*>(132)
      : IF C5=0 THEN PRINT HEX(0C0E)
      : PRINT "          FIXED AND VARIABLE COST OVERVIEW "
      : PRINT HEX(0A0A)
5075 PRINT "          SOURCE          FIXED          VARIABLE !          SOURCE
          FIXED          VARIABLE"
5077 PRINT "          *****          *****          ***** !          *****
          *****          *****"
5078 PRINT "          !"
      : SELECT PRINT 005(80)
      : RETURN

5080 DEFFN '95
      : SELECT PRINT <P0*>(132)
      : FOR N3=1 TO 24
      : N4=N3+24
      : N5=N4
      : IF N4=46 THEN N5=60
      : IF N3<3 OR N3=8 OR N3=9 THEN 5090
      : IF N3>17 THEN 5095
5085 PRINT USING 3660,A0*(N3),N3,A9*(N3),F1(N3),V(N3),A0*(N4),N4,A9*(N4),F1(N4),V
      (N4)
      : GOTO 5100

5090 PRINT USING 3650,A0*(N3),N3,A9*(N3),F1(N3),V(N3),A0*(N4),N4,A9*(N4),F1(N4),V
      (N4)
      : GOTO 5100

5095 IF N3>22 THEN 5097
      : PRINT USING 3670,A0*(N3),N3,A9*(N3),F1(N3),V(N3),A0*(N4),N5,A9*(N4),F1(N5),V
      (N5)
      : GOTO 5100

5097 PRINT USING 3680,A0*(N3),N3,A9*(N3),F1(N3),V(N3)
5100 NEXT N3
      : PRINT USING 5110,F1(46),V(46)
      : PRINT HEX(0C)
      : SELECT PRINT 005(80)
      : RETURN

5110 %
      -****,***,***.**-****,***,***.***

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*** COMP.ECN *** (2/10/80)

A	-	3840	3850	4300	4310	4320													
A\$	-	0070																	
A\$(-	0160	0280	0300	0340	0400	0420	2720	2730	2740	2750	2760	2770	2790					
A0	-	0800	0810	1290	1300	1840	1850	2360	2365	2370									
A0\$	-	0150	0470	0480															
A0\$(	-	0150	0184	0185	0186	0187	3615	3620	3630	3635	5085	5090	5095	5097					
A1	-	0760																	
A1\$	-	0160	0453	0455	0530	1130	1660	2190	2460	2470	2570	3390	3400	3410					
A1(	-	0170	2500	2505	2506	2510	2515	4300	4310	4320									
A2	-	2420	3490																
A2\$	-	0780	1270	1820	2340														
A2(	-	0170	0180	2490	2500	2505	2506	2510	2515	2541	3850								
A3\$	-	2970	3050																
A4\$	-	0530	1130	1660	2190														
A5\$	-	0830	0850	0860	1320	1340	1350	1870	1890	1900	2390	2410	2420	3540	3880				
A6\$	-	0160	2550	2560															
A7\$	-	0665	0823																
A8\$	-	0890	0990	1015	1380	1500	1525	1930	2030	2055	2450								
A9\$	-	4050																	
A9\$(	-	0150	0184	0188	3615	3620	3630	3635	5085	5090	5095	5097							
B(	-	0160	0443	0444	0446	0447	0448	0449	0450	0453	0455	0461	0500	0515	0520				
		0545	0560	0578	0579	0630	0640	0700	0710	0720	0730	0780	0790	0800	0821				
		1145	1150	1168	1169	1220	1230	1240	1270	1280	1290	1310	1315	1675	1680				
		1698	1699	1760	1770	1790	1820	1830	1840	1860	1865	2205	2210	2228	2229				
		2290	2300	2310	2340	2350	2365	2385	2850	2870	2910	2911	2970	3050	3120				
		3140	3160	3180	3230	3270	3300	3360	3460	3510	3615	3620	3630	3635	3720				
		3730	3750	3760	3770	3780	3790	3805	3807	3931	4250	4300	4310	4320	4400				
		4410	4420																
B\$(	-	0160	0370	1100	1630	2160	2850	4290	5030	5040									
B1	-	2970	2990	3000															
B1\$	-	0160	0370	0520	0825	0841	1100	1125	1331	1630	1640	1655	1881	2160	2170				
		2185	2401	3810	4290	5040													
B2	-	0446	0447	0450	3050	3060	3070	3080											
B2\$	-	0160	0370	1100	1125	1331	1630	2160	4290	5040									
B9\$	-	0070																	
C	-	0390	0400	2790															
C(	-	0050	0950	1330	1331	1440	1880	1881	1970	2400	2401								
C0(	-	0160	0640	0750	0760	0820	0821	0895	1169	1240	1310	1315	1385	1699	1790				
		1860	1865	1935	2229	2310	2380	2385	2455	2965	2970	2990	3000	3010	3035				
		3050	3070	3080	3090	3115	3120	3130	3140	3150	3160	3170	3180	3190	3230				
		3270	3300	3310	3320	3370	3470	3490	3510	3615	3620	3630	3635	3931	5020				
		5030																	
C1	-	0700	0710	0720	0730														
C2\$	-	0160																	
C3\$	-	0160																	
C4\$	-	0160																	
C5	-	0570	5070																
C5\$	-	0570	0821	1160	1315	1690	1865	2220	2385										
D\$	-	0160																	
D\$(	-	0060	1410	1470	1655	1881	1900	1990	2185	2401									
D0\$(	-	0060	1950	2000	2185	2401	2420												
D1	-	0430	2920	3025															
D1\$(	-	0060	0520	0825	0841	1390	1640	1940	2170										
D2\$(-	0060	0520	0825	0841	1940	2170												
D3	-	3230	3270																
E	-	0290	0330	2840	2850	2860	5020	5030											
E2	-	0710	2740																
F	-	0447																	

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F0	-	0150	0210	0571	0572	0574	0580	0600	0620	1161	1162	1164	1691	1692	1694
		2221	2222	2224											
F0	-	0640	1230	1240	1770	1790	2300	2310							
F1	-	0630	0640	0750	0760	1220	1230	1760	1770	2290	2300				
F10	-	0170	0570	0578	0630	0821	1160	1168	1220	1315	1690	1698	1760	1865	2220
		2228	2290	2385	5085	5090	5095	5037	5100						
F2	-	0700	0710	0720	2720										
F20	-	0150	1030	1170	1190	1210									
F30	-	0150	1535	1710	1730	1750									
F40	-	0150	2070	2240	2260	2280									
G0	-	0060	0930	0950	1040	1400	1450	1440	1540	1950	1960	1970	2080		
G*0	-	0060	0910	0920	0930	1400	1410	1430	1950	1960					
G1	-	0455													
H	-	0180	0490	2541	4165	4170	4185	4190	4200	4220					
I	-	0230	0240	0300	0520	0825	0841	0895	0950	0960	0970	0980	1040	1050	1125
		1160	1230	1280	1331	1350	1385	1440	1450	1470	1480	1490	1540	1550	1655
		1690	1881	1900	1935	1970	1980	1990	2000	2010	2020	2080	2085	2185	2220
		2401	2420	2455											
I1	-	0443	2920	3230											
I2	-	0444	3025	3270											
I3	-	0520	1160	1169	1290	1310	1315	1690	1699	1770	1830	1840	1860	1865	2220
		2229	2300	2350	2365	2385									
I40	-	0160	3510	3720	3730	3750	3760	3770	3780	3790	3800	3807	3931		
J	-	0430	0445	2490											
J1	-	2830	2850	2860	5020	5030									
K	-	0950	1040	1440	1540	1610	1640	1970	2080	2140	2170				
K*0	-	0160	0200	2495	3810										
K1*0	-	0160	3810	3820	3840										
L	-	0570	0571	0572	0574	0578	0579	0580	0600	0620	0630	0640	0650	0670	0680
		0690	0730	0740	0750	0760	0780	0790	0820	0821	1160	1161	1162	1164	1168
		1169	1170	1190	1210	1220	1240	1270	1280	1310	1315	1390	1690	1691	1692
		1694	1698	1699	1710	1730	1750	1760	1790	1820	1830	1860	1865	1940	2220
		2221	2222	2224	2228	2229	2240	2260	2280	2290	2310	2340	2350	2380	2385
		3340	3342	3345	3360	3370	3510	3520							
L10	-	0150	0210	0780	0790										
L20	-	0150	1030	1270	1280										
L30	-	0150	1535	1820	1830										
L40	-	0150	2070	2340	2350										
M	-	0443	0444	0730	0805	0860	0900	0950	0970	1295	1350	1440	1480	1845	1900
		1970	2010	2367	2390	2840	2850	2860	2950	3020	3030	3100	3200	3240	3250
		3280	3300	3310	3320	3330	5020	5030							
N	-	0540	0542	0545	0560	1140	1142	1145	1150	1670	1672	1675	1680	2200	2202
		2205	2210												
N*0	-	0150													
N0	-	0060													
N1	-	0050	0060	0230	0930	0950	0960	1040	1390	1430	1440	1450	1540	1940	1960
		1970	1980	2080											
N2*	-	0160	0240	0260	0400	0446	0825	0841	0860						
N3	-	3610	3615	3620	3630	3635	3640	5080	5085	5090	5095	5097	5100		
N4	-	3610	3615	3620	3630	5080	5085	5090	5095						
N5	-	3610	3630	5080	5095										
O	-	0930	1430	1960	2920	3025	3230	3240	3270	3280					
O0	-	0170	2541	2580	2590	2600	2605	4400	4410	4420					
P	-	0571	0572	0574	0578	0590	0610	0620	0630	1161	1162	1164	1168	1180	1200
		1210	1220	1691	1692	1694	1698	1720	1740	1750	1760	2221	2222	2224	2228
		2250	2270	2280	2290										
P0	-	0574	0620	1164	1210	1694	1750	2224	2280						
P0*	-	0650	0830	1320	1870	2390	2480	2570	3550	3890	5070	5080			
P1	-	0571	0572	0574	0580	0600	0620	1161	1162	1164	1170	1190	1210	1691	1692
		1694	1710	1730	1750	2221	2222	2224	2240	2260	2280	3230	3270		

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P2	-	0700	2730																	
P3	-	0574	0620	1164	1210	1694	1750	2224	2280											
G	-	0290	0300	0330	0340	2720	2730	2740	2750	2760	2770	2790								
G\$	-	0270	0330	0360	0399	0400	1070	1090	1570	1590	1610	1620	2100	2120	2140					
		2150	4160	4180	4280	4285														
R	-	3480	3490																	
R(	-	0170	0895	1385	1935	2455	3720	3730	3750	3760	3770	3780	3790	3800	3805					
		3807	3850	3915	3920	3925	3930	3931												
R\$(	-	0150	0210	0670	0680	0690														
R1	-	2910	2920	2965	2967	2970	4260													
R1\$	-	0160	0340	0350																
R2	-	2910	2911	3025	3035	3037	3050	4260												
R2\$(	-	0150	1030																	
R3	-	0500	0510	0515	0520	0579	0640	0750	0760	0790	0800	0820	0821	2360						
R3(	-	0060	0520	0950	1440	1970														
R3\$(	-	0150	1535																	
R4	-	0890	0990	1010	1015	1380	1500	1520	1525	1930	2030	2050	2055	2450	2965					
		2970	2990	3000	3010															
R4\$(	-	0150	2070																	
R5	-	0890	0990	1020	1380	1500	1530	1930	2030	2060	2450	3035	3050	3070	3060					
		3090																		
S	-	3440	3445	3447	3450	3460	3470	3490												
S1(	-	0060	0950	1040	1160	1230	1280	1400	1440	1540	1690	1950	1970	2080	2220					
S2	-	0720	2750																	
S2(	-	0060	0950	1160	1230	1280	1400	1440	1690	1950	1970	2220								
U\$	-	0160	0310	0320	1050	1060	1550	1560	2085	2090	4160	4180	4270							
U\$(	-	0060	0920	0960	1050	1125	1331	1350	1470	1550	1655	1881	1990	2085	2185					
		2401																		
U1\$	-	0160	0300	0310	0825	0841														
U1\$(	-	0060	0300	0910	0920	1390	1940													
V	-	0630	0640	1220	1240	1760	1790	2290	2310											
V(	-	0170	0570	0578	0630	1160	1168	1220	1690	1698	1760	2220	2226	2290	2065					
		5090	5095	5097	5100															
V0	-	0640	0650	0810	0820	1240	1250	1300	1310	1790	1800	1850	1860	2310	2320					
		2370	2380																	
V2	-	0640	0810	0820	1240	1300	1310	1790	1850	1860	2310	2370	2380							
W	-	2541	3850																	
W\$	-	0060	0910	1400	1950															
W(	-	0060	0520	0950	1440	1970														
W0	-	0800	1290	1840	2365															
W1	-	0455	0500																	
W2	-	0500																		
W3	-	0500																		
W4	-	0730	0740	0760																
W9	-	0760																		
X	-	0443	0444	2490	2495	2500	2505	2506	2510	2515	2540	2950	2965	2970	2990					
		3000	3010	3030	3035	3050	3070	3080	3090	3200	3230	3250	3270							
X\$	-	4050																		
X\$(	-	0050	1940	1950																
X1	-	0447	0450	0453	0455	0476	0485	0487	0500	0515	3160									
X1\$(	-	0050	1390	1400	1410															
X2	-	0453	0455	0475	0476	0487	0500	0515	3120											
X3	-	0447	0450	0453	0455	0460	0476	0487	0500	0515	2760	2780	3160							
X4	-	1030	1330	1331	1535	1880	1881	2070	2400	2401										
X5	-	0455	0462	0500	0515	2770	2780													
X6	-	0453	0455	0463	0500	0515														
X7	-	0447	0450	0453	0455	0500	0515	3180												
X8	-	0515																		
X9	-	0453	3160																	
Y	-	0780	0800	1270	1290	1820	1840	2340	2360											
Y1	-	0790	0800	1280	1290	1830	1840	2350	2360											
Z\$	-	0160	0390	0399	0400	0446	0660	0621												
Z0\$	-	0150	0823																	

VARIABLE DEFINITIONS

ECON

A\$ = Device address of data base files
 A3\$ = 'Y' or 'N' answer for use of partial billets
 A4\$ = 'Y' or 'N' for allowing changes in original data
 A5\$ = 'Y' or 'N' for printed copies of original, revised and summary costs
 A8\$ = Flag for choosing to input average annual pay
 A9\$ = 'Y' or 'N' for saving revised cost estimates

 B0\$ = 'R' or 'O' for replacing or omitting an invalid CDP

 D = Numeric fiscal year of data base (YY)
 D1 = Number of months between data base creation and date to begin implementing changes
 D2 = Numeric year of implementation (YY)
 D2\$ = Alpha date of implementation (MM/YY)
 D3 = Number of months after implementation ends before cost estimates become effective
 D4 = Numeric month of implementation (MM)

 I1 = Inflation rate for MPN
 I2 = Inflation rate for O&MN

 N2\$ = Course data processing number (CDP)
 N1 = Number of courses to be run concurrently

 P1 = Planning period in months

 R1 = Average military pay
 R2 = Average civilian pay

COMP. ECON

A = Ordinal position of UIC in UICLIST
 A\$() = Stored data from CRSF101 file (NITRAS origin)
 A0 = Percentage change in linear regression estimates of average total costs
 A0\$ = Flag for specifying enrollments or inputs
 A0\$() = Print headings for percap cells
 A1 = Average cost, adjusted for capacity
 A1() = Sums of original costs by category for each affected activity
 A2() = Sums of cost change by category for each affected activity
 A6\$ = Flag for printouts of activity summaries

 B\$() = Packed per capita cost data
 B1 = Revised number of military billets
 B1\$ = Per capita descriptive data
 B2 = Revised number of civilian billets
 B2\$ = Alphanumeric per capita information

TAEG Report No. 77

C = Course number within an RMS group
 C() = Number of courses affected in an activity, department or division
 C0() = Revised cost estimates
 C1 = Course capacity in training days

 D\$() = Department codes in sorted order
 D0\$ = Division codes in sorted order
 D1\$() = Department codes in input order
 D2\$() = Division codes in input order

 E2 = Equipment input capacity
 F(),F2() = Fixed and variable endpoints at each of the four levels
 F3(),F4() =
 F0 = Average fixed cost for one cell
 F1 = Total fixed cost for one cell
 F2 = Course frequency per year

 G() = Numeric subscripts for input order
 G\$() = Hexidecimal digits for input order
 G1 = Training days computed from current level data

 I = Counter for major loop
 I3 = Incremental work units from current to revised level
 I4() = Cost changes for each cell

 K = Subscript for input position
 K\$() = List of UICs in per capita data base
 K1\$() = Hex position of UICs in UICLIST

 L = Minor loop counter
 L1() = Regression coefficients at course level
 L2(),L3() = Regression coefficients at activity, department and division level
 L4() =

 O() = Overall cost totals by category

 P = Proportion of costs which are fixed
 P0 = Months of planning exceeding fixed point
 P2 = Personnel input capacity
 P3 = Months between fixed and variable endpoints

 R() = Cost sums for each record by category
 R\$(),R2\$() = Codes for related input capacity at the four levels
 R3\$(),R4\$() =
 R1\$ = RMS cost code
 R3 = Revised level work units for a record

 S1() = Sum of current work units affected in an activity, department or division
 S2() = Sum of revised work units for affected records in an activity, department or division
 S2 = Space input capacity

TAEG Report No. 77

U\$ = File name for a per capita activity file
U\$() = Storage array for affected UICs in sorted order
UI\$ = Unit Identification Code (UIC)
UI\$() = Storage array for affected UICs in input order

V = Total variable cost for one cell
V0 = Average variable cost for one cell

W() = Storage array for current work units
W0 = Percentage change in work units
W1 = Current level computed work units
W2 = Revised level computed work units
W3 = Incremental computed work units
W4 = Percentage deviation of work units from capacity levels
W9 = Work units accountable for by fixed costs

X\$ = UIC, department and division codes
X1 = Enrollments
X1\$ = UIC and department codes
X2 = Graduates
X3 = Attrition rate
X5 = Setback rate
X6 = Proportion of course repeated for a setback
X7 = Weeks of attrition per attrite
X8 = Change in graduates from current to revised levels

Y = Current predicted average cost for one cell
Y1 = Revised predicted average cost for one cell

Z\$ = Flag for group membership

TAEG Report No. 77

SAMPLE OUTPUT

*** COST MODEL PROGRAM ***

* INPUT PARAMETERS *

INFLATION RATE FOR MPN .04
INFLATION RATE FOR O&MN .06
NUMBER OF COURSES TO BE ALTERED 1
PLANNING TIME (IN MONTHS) 6
PARTIAL BILLETS ? Y
ORIGINAL DATA CHANGES ? N
SAVE REVISED COST ESTIMATES ? N
COPIES OF COST SUMMARIES ? Y
BYPASS CAPACITY ADJUSTMENTS ? Y
BYPASS SCALE ADJUSTMENTS ? N
PRINT FIXED AND VARIABLE COSTS ? Y

FIXED AND VARIABLE COST OVERVIEW

SOURCE		FIXED		VARIABLE		SOURCE		FIXED		VARIABLE	
=====		=====		=====		=====		=====		=====	
DIRECT	1. M.LB	49,013 HOURS	\$0.00	24,506 HOURS	IN.CMD	25. M.LB	\$0.00				\$0.00
	2. C.HR	0 HOURS	\$0.00	0 HOURS		26. C.LB	\$0.00				\$0.00
	3. M.LB	\$301,395.99	\$0.00	\$150,637.99		27. SUPP	\$0.00				\$0.00
	4. C.LB	\$0.00	\$0.00	\$0.00		28. CONT	\$0.00				\$0.00
	5. SUPP	\$0.00	\$0.00	\$41,555.43		29. MISC	\$0.00				\$0.00
	6. CONT	\$0.00	\$0.00	\$95.74		30. M.LB	\$0.00				\$0.00
	7. MISC	\$0.00	\$0.00	\$986.59		STF.PCS	\$14,101.11				\$7,050.55
AC-FC GP	8. M.LB	0 HOURS	\$0.00	0 HOURS	STF.BMD	31. M.LB	\$14,338.86				\$7,169.43
	9. C.HR	0 HOURS	\$0.00	0 HOURS		32. MISC	\$0.00				\$0.00
	10. M.LB	\$0.00	\$0.00	\$0.00		STF-F.H.	\$4,683.18				\$0.00
	11. C.LB	\$0.00	\$0.00	\$0.00		EQ.DEP	\$0.00				\$0.00
	12. SUPP	\$0.00	\$0.00	\$0.00		BLD.DEP	\$0.00				\$44,865.66
	13. CONT	\$0.00	\$0.00	\$0.00		STU.BMD	\$0.00				\$45,465.36
	14. MISC	\$0.00	\$0.00	\$0.00		37. MISC	\$0.00				\$0.00
HOST-ACT	15. M.LB	\$0.00	\$0.00	\$0.00		38. M.LB	\$0.00				\$0.00
	16. MISC	\$0.00	\$0.00	\$0.00		STU.TUL	\$0.00				\$0.00
OT-ACT	17. M.LB	\$0.00	\$0.00	\$0.00		39. M.LB	\$0.00				\$0.00
	18. MISC	\$0.00	\$0.00	\$0.00		40. MISC	\$0.00				\$0.00
TR-EQ-MT	19. MISC	\$0.00	\$0.00	\$0.00		STU-SAL	\$0.00				\$1,406,448.91
MJ-PJT	20. MISC	\$0.00	\$0.00	\$0.00		41. M.LB	72				0
ADP	21. M.LB	\$0.00	\$0.00	\$0.00		STA.DATA	995				0
	22. MISC	\$0.00	\$0.00	\$0.00		43. GRADS	56				0
CNETS	23. M.LB	\$0.00	\$0.00	\$0.00		44. LENGTH	16				0
	24. MISC	\$0.00	\$0.00	\$0.00		45. ATRTS	2,041				0
						60. W.UTS					
						TOTALS					
							\$334,519.15				\$1,704,335.71

IC-AI RMS SCDB DISTR. CODE 0303701
 COURSE 6073 DIV.03 DEPT.03 UIC 0581A
 SUMMARY OF COST ESTIMATES

SOURCE	CURRENT	REVISED	SOURCE	CURRENT	REVISED
DIRECT	73,520 HOURS	96,743 HOURS	FN.CMD	25. M.LB	\$0.00
1. M.HR	0 HOURS	0 HOURS	26. C.LB	\$0.00	\$0.00
2. C.HR	\$461,211.55	\$606,898.93	27. SUPP	\$0.00	\$0.00
3. M.LB	\$0.00	\$0.00	28. CONT	\$0.00	\$0.00
4. C.LB	\$42,817.78	\$83,393.58	29. MISC	\$0.00	\$0.00
5. SUPP	\$98.65	\$192.14	30. M.LB	\$0.00	\$0.00
6. CONT	\$1,016.56	\$1,979.89	31. M.LB	\$21,578.25	\$28,394.38
7. MISC	0 HOURS	0 HOURS	32. MISC	\$22,161.66	\$23,162.07
8. M.HR	0 HOURS	0 HOURS	33. MISC	\$0.00	\$0.00
9. C.HR	\$0.00	\$0.00	34. MISC	\$4,825.44	\$4,825.44
10. M.LB	\$0.00	\$0.00	35. MISC	\$0.00	\$0.00
11. C.LB	\$0.00	\$0.00	36. M.LB	\$45,770.49	\$89,144.40
12. SUPP	\$0.00	\$0.00	37. MISC	\$46,846.49	\$91,240.06
13. CONT	\$0.00	\$0.00	38. M.LB	\$0.00	\$0.00
14. MISC	\$0.00	\$0.00	39. M.LB	\$0.00	\$0.00
15. M.LB	\$0.00	\$0.00	40. MISC	\$0.00	\$0.00
16. MISC	\$0.00	\$0.00	41. M.LB	\$1,434,813.34	\$2,869,626.63
17. M.LB	\$0.00	\$0.00	42. AT-WMS	995	136
18. MISC	\$0.00	\$0.00	43. GRADS	56	1,891
19. MISC	\$0.00	\$0.00	44. LENGTH	16	56
20. MISC	\$0.00	\$0.00	45. ATRTS	30	30
21. M.LB	\$0.00	\$0.00	60. W.UTS	2,041	4,082
22. MISC	\$0.00	\$0.00			
23. M.LB	\$0.00	\$0.00			
24. MISC	\$0.00	\$0.00			

SUMMARY OF COSTS BY CATEGORY

RESOURCE TYPE	CURRENT COSTS	REVISED COSTS	CHANGE
MIL HOURS	73,520	96,743	+23,223
CIV HOURS	0	0	+0
MIL LABOR COSTS	\$528,560.30	\$724,437.72	+\$195,877.41
CIV LABOR COSTS	\$0.00	\$0.00	+\$0.00
SUPPLIES	\$42,817.78	\$83,393.58	+\$40,575.80
CONTRACT	\$98.65	\$192.14	+\$93.48
MISC	\$74,850.15	\$127,207.48	+\$52,357.32
STUDENT P&L	\$1,434,813.34	\$2,869,626.63	+\$1,434,813.34
TOTALS	\$2,081,140.24	\$3,804,857.63	+\$1,723,717.38
FUNDING			
MPN	\$1,963,373.05	\$3,594,064.42	+\$1,630,690.76
OSMNI	\$112,941.15	\$205,967.76	+\$93,026.61
OTHER	\$4,825.44	\$4,825.44	-\$0.00
TOTALS	\$2,081,140.24	\$3,804,857.63	+\$1,723,717.38

END OF DATA FOR COURSE 6073

FIXED AND VARIABLE COST OVERVIEW

SOURCE =====		FIXED =====		VARIABLE =====		SOURCE =====		FIXED =====		VARIABLE =====	
DIRECT	1. M.HR	323,958 HOURS		164,373 HOURS		FN.CMD	25. M.LB	\$168,254.00		\$84,127.00	
	2. C.HR	0 HOURS		48,230 HOURS			26. C.LB	\$103,477.80		\$68,985.20	
	3. M.LB	\$2,282,536.66		\$1,141,263.33			27. SUPP	\$11,638.40		\$2,303.60	
	4. C.LB	\$174,087.60		\$116,058.40			28. CONT	\$5,785.60		\$1,446.40	
	5. SUPP	\$18,041.60		\$4,510.40			29. MISC	\$29,348.80		\$7,337.20	
	6. CONT	\$17,511.20		\$4,377.80		STF.PCS	30. M.LB	\$192,933.33		\$96,466.66	
	7. MISC	\$41,587.20		\$10,396.80		STF.BMD	31. M.LB	\$0.00		\$0.00	
AC-FC-SP	8. M.HR	0 HOURS		0 HOURS			32. MISC	\$0.00		\$0.00	
	9. C.HR	0 HOURS		0 HOURS		STF-F.H.	33. MISC	\$17,266.66		\$8,633.33	
	10. M.LB	\$0.00		\$0.00		EG.DEP	34. MISC	\$0.00		\$0.00	
	11. C.LB	\$0.00		\$0.00		BLD.DEP	35. MISC	\$0.00		\$0.00	
	12. SUPP	\$0.00		\$0.00		STU.BMD	36. M.LB	\$0.00		\$0.00	
	13. CONT	\$0.00		\$0.00			37. MISC	\$0.00		\$0.00	
	14. MISC	\$0.00		\$0.00		STU-F.H.	38. M.LB	\$0.00		\$0.00	
HOST-ACT	15. M.LB	\$1,873,133.33		\$339,566.66		STU.TUL	39. M.LB	\$0.00		\$0.00	
	16. MISC	\$3,736,875.00		\$1,245,625.00			40. MISC	\$0.00		\$0.00	
OT-ACT	17. M.LB	\$0.00		\$0.00		STU-SAL	41. M.LB	\$0.00		\$0.00	
	18. MISC	\$0.00		\$0.00		STA.DATA	42. AT-WKS	0		0	
TR-EQ-MT	19. MISC	\$0.00		\$0.00			43. GRADS	0		0	
MJ-PJT	20. MISC	\$0.00		\$0.00			44. LENGTH	0		0	
ADP	21. M.LB	\$19,882.00		\$9,341.00			45. ATRTS	0		0	
	22. MISC	\$566,757.75		\$188,919.25			60. W.UTS	45,882		0	
CNETS	23. M.LB	\$0.00		\$0.00						0	
	24. MISC	\$1,286,646.00		\$428,882.00						0	
						TOTALS		\$10,551,762.95		\$4,359,451.05	

AD-A081 759

TRAINING ANALYSIS AND EVALUATION GROUP (NAVY) ORLANDO FL F/G 14/1
INCREMENTAL COSTING MODEL FOR USE WITH THE CNET PER CAPITA COUR--ETC(U)
NOV 79 W M SWOPE, C YELVINGTON, J M COREY

UNCLASSIFIED

TAE6-77

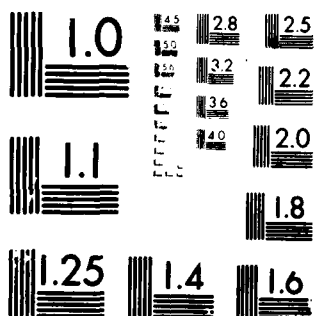
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2 of 2

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED



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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SSC SDIEGO RMS AAAA D. CODE 0000100
 ACTIVITY UIC 05B1A COURSES INVOLVED - 1

***** SUMMARY OF COST ESTIMATES *****

SOURCE	CURRENT	REVISED	SOURCE	CURRENT	REVISED
DIRECT			FN.CMD		
1. M.HR	494,938 HOURS	501,710 HOURS	25. M.LB	\$257,470.87	\$260,993.90
2. C.HR	48,230 HOURS	49,021 HOURS	26. C.LB	\$177,701.99	\$180,619.83
3. M.LB	\$3,492,854.27	\$3,540,647.75	27. SUPP	\$14,989.93	\$15,112.99
4. C.LB	\$298,959.91	\$303,868.79	28. CONT	\$7,451.63	\$7,512.86
5. SUPP	\$23,237.07	\$23,427.84	29. MISC	\$37,800.42	\$38,110.76
6. CONT	\$22,553.93	\$22,739.09	30. M.LB	\$295,236.44	\$299,276.23
7. MISC	\$53,563.14	\$54,002.89	31. M.LB	\$0.00	\$0.00
AC-FC-SP	0 HOURS	0 HOURS	32. MISC	\$0.00	\$0.00
8. C.HR	0 HOURS	0 HOURS	33. MISC	\$26,686.77	\$27,051.93
9. C.HR	0 HOURS	0 HOURS	34. MISC	\$0.00	\$0.00
10. M.LB	\$0.00	\$0.00	35. MISC	\$0.00	\$0.00
11. C.LB	\$0.00	\$0.00	36. M.LB	\$0.00	\$0.00
12. SUPP	\$0.00	\$0.00	37. MISC	\$0.00	\$0.00
13. CONT	\$0.00	\$0.00	38. M.LB	\$0.00	\$0.00
14. MISC	\$0.00	\$0.00	39. M.LB	\$0.00	\$0.00
HOST-ACT	\$2,875,545.87	\$2,914,892.59	40. MISC	\$0.00	\$0.00
15. M.LB	\$5,133,855.94	\$5,186,541.68	41. M.LB	\$0.00	\$0.00
16. MISC	\$0.00	\$0.00	42. AT-MKS	0	0
OT-ACT	\$0.00	\$0.00	43. GRADS	0	0
17. M.LB	\$0.00	\$0.00	44. LENGTH	56	0
18. MISC	\$0.00	\$0.00	45. ATRTS	0	0
TR-EQ-MT	\$30,424.45	\$30,840.75	60. W.UTS	45,882	47,923
MJ-PJT	\$778,632.58	\$786,623.23			
ADP	\$0.00	\$0.00			
21. M.LB	\$0.00	\$0.00			
22. MISC	\$0.00	\$0.00			
23. M.LB	\$0.00	\$0.00			
CNETS	\$1,767,641.46	\$1,785,781.73			
24. MISC					

***** SUMMARY OF COSTS BY CATEGORY *****

RESOURCE TYPE	CURRENT COSTS	REVISED COSTS	CHANGE
MIL HOURS	494,938	501,710	+6,772
CIV HOURS	48,230	49,021	+791
MIL LABOR COSTS	\$6,951,531.92	\$7,046,651.23	+\$95,119.31
CIV LABOR COSTS	\$476,661.90	\$484,488.63	+\$7,826.72
SUPPLIES	\$38,227.00	\$38,540.84	+\$313.84
CONTRACT	\$30,003.62	\$30,251.96	+\$248.34
MISC	\$7,798,180.34	\$7,878,112.25	+\$79,931.90
STUDENT F&L	\$0.00	\$0.00	+0.00
TOTALS	\$15,294,606.80	\$15,478,044.93	+\$183,438.13
FUNDING			
MPN	\$6,951,531.92	\$7,046,651.23	+\$95,119.31
ORNN	\$8,343,074.88	\$8,431,393.63	+\$88,318.81
OTHER	\$0.00	\$0.00	+0.00
TOTALS	\$15,294,606.80	\$15,478,044.93	+\$183,438.13

END OF DATA FOR ACTIVITY 05B1A

FIXED AND VARIABLE COST OVERVIEW

SOURCE *****		FIXED *****	VARIABLE *****	SOURCE *****	FIXED *****	VARIABLE *****
DIRECT	1. M.HR			FN.CMD		
	2. C.HR	7,184 HOURS	3,592 HOURS	25. M.LB	\$0.00	\$0.00
	3. M.LB	0 HOURS	4,545 HOURS	26. C.LB	\$0.00	\$0.00
	4. C.LB	\$51,043.33	\$25,521.66	27. SUPP	\$0.00	\$0.00
	5. SUPP	\$23,443.20	\$15,628.80	28. CONT	\$0.00	\$0.00
	6. CONT	\$305.60	\$76.40	29. MISC	\$0.00	\$0.00
	7. MISC	\$104.80	\$26.20	30. M.LB	\$0.00	\$0.00
AC-FC-SP	8. M.HR	0 HOURS	0 HOURS	31. M.LB	\$0.00	\$0.00
	9. C.HR	0 HOURS	0 HOURS	32. MISC	\$0.00	\$0.00
	10. M.LB	\$0.00	\$0.00	33. MISC	\$0.00	\$0.00
	11. C.LB	\$0.00	\$0.00	34. MISC	\$0.00	\$0.00
	12. SUPP	\$0.00	\$0.00	35. MISC	\$0.00	\$0.00
	13. CONT	\$0.00	\$0.00	36. M.LB	\$0.00	\$0.00
	14. MISC	\$0.00	\$0.00	37. MISC	\$0.00	\$0.00
HOST-ACT	15. M.LB	\$0.00	\$0.00	38. M.LB	\$0.00	\$0.00
	16. MISC	\$0.00	\$0.00	39. M.LB	\$0.00	\$0.00
OT-ACT	17. M.LB	\$0.00	\$0.00	40. MISC	\$0.00	\$0.00
	18. MISC	\$0.00	\$0.00	41. M.LB	\$0.00	\$0.00
TR-EQ-MT	19. MISC	\$0.00	\$0.00	42. AT-WKS	0	0
MJ-PJT	20. MISC	\$0.00	\$0.00	43. GRADS	0	0
ADP	21. M.LB	\$0.00	\$0.00	44. LENGTH	0	0
	22. MISC	\$0.00	\$0.00	45. ATRTS	0	0
CNETS	23. M.LB	\$0.00	\$0.00	60. W.UTS	11,629	0
	24. MISC	\$0.00	\$0.00			
				TOTALS	\$74,896.93	\$41,253.06

BASIC E&E RMS SCAA D.CODE 0301300
DEPARTMENT 03 UIC0581A 1 COURSES

***** SUMMARY OF COST ESTIMATES *****

SOURCE	CURRENT	REVISED	SOURCE	CURRENT	REVISED
DIRECT	10,776 HOURS	11,348 HOURS	FN.CMD		
1. M.HR	4,545 HOURS	4,834 HOURS	25. M.LB	\$0.00	\$0.00
2. C.HR	\$78,109.11	\$82,257.73	26. C.LB	\$0.00	\$0.00
3. M.LB	\$40,258.91	\$42,824.83	27. SUPP	\$0.00	\$0.00
4. C.LB	\$393.60	\$406.14	28. CONT	\$0.00	\$0.00
5. SUPP	\$134.97	\$139.28	29. MISC	\$0.00	\$0.00
6. CONT	\$0.00	\$0.00	30. M.LB	\$0.00	\$0.00
7. MISC	\$0.00	\$0.00	31. M.LB	\$0.00	\$0.00
8. M.HR	\$0.00	\$0.00	32. MISC	\$0.00	\$0.00
9. C.HR	\$0.00	\$0.00	33. MISC	\$0.00	\$0.00
10. M.LB	\$0.00	\$0.00	34. MISC	\$0.00	\$0.00
11. C.LB	\$0.00	\$0.00	35. MISC	\$0.00	\$0.00
12. SUPP	\$0.00	\$0.00	36. M.LB	\$0.00	\$0.00
13. CONT	\$0.00	\$0.00	37. MISC	\$0.00	\$0.00
14. MISC	\$0.00	\$0.00	38. M.LB	\$0.00	\$0.00
15. M.LB	\$0.00	\$0.00	39. M.LB	\$0.00	\$0.00
16. MISC	\$0.00	\$0.00	40. MISC	\$0.00	\$0.00
17. M.LB	\$0.00	\$0.00	41. M.LB	\$0.00	\$0.00
18. MISC	\$0.00	\$0.00	42. AT-4MIS	0	0
19. MISC	\$0.00	\$0.00	43. GRADE	0	0
20. MISC	\$0.00	\$0.00	44. LENGTH	56	56
21. M.LB	\$0.00	\$0.00	45. AFRITS	0	0
22. MISC	\$0.00	\$0.00	60. W.UTS	11,629	13,670
23. M.LB	\$0.00	\$0.00			
24. MISC	\$0.00	\$0.00			

***** SUMMARY OF COSTS BY CATEGORY *****

RESOURCE TYPE	CURRENT COSTS	REVISED COSTS	CHANGE
MIL HOURS	10,776	11,348	+572
CIV HOURS	4,545	4,834	+289
MIL LABOR COSTS	\$78,109.11	\$82,257.73	+\$4,148.61
CIV LABOR COSTS	\$40,258.91	\$42,824.83	+\$2,565.92
SUPPLIES	\$393.60	\$406.14	+\$12.54
CONTRACT	\$134.97	\$139.28	+\$4.30
MISC	\$0.00	\$0.00	+\$0.00
STUDENT P&L	\$0.00	\$0.00	+\$0.00
TOTALS	\$118,896.61	\$125,627.99	+\$6,731.38
FUNDING			
MFN	\$78,109.11	\$82,257.73	+\$4,148.61
OMN	\$40,787.40	\$43,370.26	+\$2,582.77
OTHER	\$0.00	\$0.00	+\$0.00
TOTALS	\$118,896.61	\$125,627.99	+\$6,731.38

END OF DATA FOR DEPARTMENT 03

FIXED AND VARIABLE COST OVERVIEW

SOURCE =====		FIXED =====	VARIABLE =====	SOURCE =====	FIXED =====	VARIABLE =====
DIRECT	1. M.HR	0 HOURS	0 HOURS	FN.CMD	25. M.LB	\$0.00
	2. C.HR	0 HOURS	0 HOURS		26. C.LB	\$0.00
	3. M.LB	\$0.00	\$0.00		27. SUPP	\$0.00
	4. C.LB	\$0.00	\$0.00		28. CONT	\$0.00
	5. SUPP	\$0.00	\$500.00		29. MISC	\$0.00
	6. CONT	\$0.00	\$120.00	STF.PCS	30. M.LB	\$0.00
	7. MISC	\$0.00	\$75.00	STF.BMD	31. M.LB	\$0.00
AC-FC-SP	8. M.HR	0 HOURS	0 HOURS		32. MISC	\$0.00
	9. C.HR	0 HOURS	0 HOURS	STF-F.H.	33. MISC	\$0.00
	10. M.LB	\$0.00	\$0.00	EQ.DEP	34. MISC	\$0.00
	11. C.LB	\$0.00	\$0.00	BLD.DEP	35. MISC	\$0.00
	12. SUPP	\$0.00	\$0.00	STU.BMD	36. M.LB	\$0.00
	13. CONT	\$0.00	\$0.00		37. MISC	\$0.00
	14. MISC	\$0.00	\$0.00	STU-F.H.	38. M.LB	\$0.00
HOST-ACT	15. M.LB	\$0.00	\$0.00	STU.TUL	39. M.LB	\$0.00
	16. MISC	\$0.00	\$0.00		40. MISC	\$0.00
OT-ACT	17. M.LB	\$0.00	\$0.00	STU-SAL	41. M.LB	\$0.00
	18. MISC	\$0.00	\$0.00	STA.DATA	42. AT-WKS	0
TR-EQ-MT	19. MISC	\$0.00	\$0.00		43. GRADS	0
HJ-PJT	20. MISC	\$0.00	\$0.00		44. LENGTH	0
AOP	21. M.LB	\$0.00	\$0.00		45. ATRTS	0
	22. MISC	\$0.00	\$0.00		60. W.UTS	0
CNETS	23. M.LB	\$0.00	\$0.00			
	24. MISC	\$0.00	\$0.00			
				TOTALS		\$695.00
						\$0.00

IC SCOLS RMS SCDA D.CODE 0303500
DIVISION 03 DEPT.03 UIC 0581A 1 COURSES

***** SUMMARY OF COST ESTIMATES *****

SOURCE	CURRENT	REVISED	SOURCE	CURRENT	REVISED
DIRECT					
1. M.HR	0 HOURS	0 HOURS	25. M.LB	\$0.00	\$0.00
2. C.HR	0 HOURS	0 HOURS	26. C.LB	\$0.00	\$0.00
3. M.LB	\$0.00	\$0.00	27. SUPP	\$0.00	\$0.00
4. C.LB	\$0.00	\$0.00	28. CONT	\$0.00	\$0.00
5. SUPP	\$515.18	\$880.75	29. MISC	\$0.00	\$0.00
6. CONT	\$123.64	\$211.38	30. M.LB	\$0.00	\$0.00
7. MISC	\$77.27	\$132.11	31. M.LB	\$0.00	\$0.00
AC-FC-SP			32. MISC	\$0.00	\$0.00
8. M.HR	0 HOURS	0 HOURS	33. MISC	\$0.00	\$0.00
9. C.HR	0 HOURS	0 HOURS	34. MISC	\$0.00	\$0.00
10. M.LB	\$0.00	\$0.00	35. MISC	\$0.00	\$0.00
11. C.LB	\$0.00	\$0.00	36. M.LB	\$0.00	\$0.00
12. SUPP	\$0.00	\$0.00	37. MISC	\$0.00	\$0.00
13. CONT	\$0.00	\$0.00	38. M.LB	\$0.00	\$0.00
14. MISC	\$0.00	\$0.00	39. M.LB	\$0.00	\$0.00
HOST-ACT			40. MISC	\$0.00	\$0.00
15. M.LB	\$0.00	\$0.00	41. M.LB	\$0.00	\$0.00
16. MISC	\$0.00	\$0.00	42. AT-MKS	0	0
OT-ACT			43. GRADS	0	0
17. M.LB	\$0.00	\$0.00	44. LENGTH	56	0
18. MISC	\$0.00	\$0.00	45. ATTRS	9	0
TR-EQ-M	\$0.00	\$0.00	60. W.UTS	2,373	4,414
MA-PJT	\$0.00	\$0.00			
20. M.LB	\$0.00	\$0.00			
21. M.LB	\$0.00	\$0.00			
22. MISC	\$0.00	\$0.00			
23. M.LB	\$0.00	\$0.00			
24. MISC	\$0.00	\$0.00			

***** SUMMARY OF COSTS BY CATEGORY *****

RESOURCE TYPE	CURRENT COSTS	REVISED COSTS	CHANGE
MIL HOURS	0	0	+0
CIV HOURS	0	0	+0
MIL LABOR COSTS	\$0.00	\$0.00	+0.00
CIV LABOR COSTS	\$0.00	\$0.00	+0.00
SUPPLIES	\$515.18	\$880.75	+\$365.56
CONTRACT	\$123.64	\$211.38	+\$87.73
MISC	\$77.27	\$132.11	+\$54.83
STUDENT PBL	\$0.00	\$0.00	+0.00
TOTALS	\$716.11	\$1,224.24	+\$508.13
FUNDING			
MPN	\$0.00	\$0.00	+0.00
OBAN	\$716.11	\$1,224.24	+\$508.13
OTHER	\$0.00	\$0.00	+0.00
TOTALS	\$716.11	\$1,224.24	+\$508.13

END OF DATA FOR DIVISION 03

 ACTIVITY ID=0581A

 COST CHANGES BY ACTIVITY

RESOURCE TYPE *****	CURRENT COSTS *****	REVISED COSTS *****	CHANGE *****
MIL HOURS	2,232,954	2,263,532	+30,568
CIV HOURS	80,397	81,476	+1,081
MIL LABOR COSTS	\$20,166,141.00	\$20,461,286.34	+\$295,145.34
CIV LABOR COSTS	\$729,826.00	\$740,218.64	+\$10,392.64
SUPPLIES	\$790,659.00	\$831,925.75	+\$41,267.75
CONTRACT	\$111,493.00	\$111,924.86	+\$431.86
MISC	\$11,465,895.00	\$11,598,239.06	+\$132,344.06
STUDENT PUL	\$37,368,900.00	\$38,803,713.34	+\$1,434,813.34
TOTALS	\$70,632,914.00	\$72,547,309.03	+\$1,914,395.03
FUNDING			
MMW	\$67,535,041.00	\$69,264,399.69	+\$1,729,358.69
EDWW	\$11,465,573.00	\$11,650,009.34	+\$184,436.34
OTWDR	\$1,632,300.00	\$1,632,300.00	-80.00
TOTALS	\$70,632,914.00	\$72,547,309.03	+\$1,914,395.03

TOTAL COST CHANGES BY CATEGORY

RESOURCE TYPE *****	CURRENT COSTS *****	REVISED COSTS *****	CHANGE *****
MIL HOURS	2,232,954	2,263,522	+30,568
CIV HOURS	80,397	81,478	+1,081
MIL LABOR COSTS	\$20,166,141.00	\$20,461,286.34	+\$295,145.34
CIV LABOR COSTS	\$729,826.00	\$740,218.64	+\$10,392.64
SUPPLIES	\$790,659.00	\$831,926.75	+\$41,267.75
CONTRACT	\$111,493.00	\$111,924.86	+\$431.86
MISC	\$11,465,895.00	\$11,598,239.06	+\$132,344.06
STUDENT P&L	\$37,368,900.00	\$38,803,713.34	+\$1,434,813.34
TOTALS	\$70,632,914.00	\$72,547,309.03	+\$1,914,395.03
FUNDING			
MFN	\$57,535,041.00	\$59,264,999.69	+\$1,729,958.69
OBAN	\$11,465,573.00	\$11,650,009.34	+\$184,436.34
OTHER	\$1,632,300.00	\$1,632,300.00	-\$0.00
TOTALS	\$70,632,914.00	\$72,547,309.03	+\$1,914,395.03

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APPENDIX C

DEFINITION OF ACRONYMS

AC-FC-SP	Activity Facility Support
ADP	Automatic Data Processing
BLD-DEP	Building Depreciation
C. HR	Civilian Labor Hours
C. LB	Civilian Labor Costs
CNETS	Chief of Naval Education and Training Support
CONT	Contract Costs
DIRECT	Direct Costs
EQ-DEP	Equipment Depreciation Costs
FN-CMD	Functional Command
HOST-ACT	Host Activity Support
M. HR	Military Labor Hours
MISC	Miscellaneous Costs
MJ. PJT	Major Project Costs
M. LB	Military Labor Costs
OT-ACT	Other Activity Support
STA-DATA	Statistical Data
STF-BMD	Staff Bureau of Medicine
STF-PCS	Staff Permanent Change of Station
STU-BMD	Student Bureau of Medicine
STU-F.H.	Student Family Housing
STU-SAL	Student Salary
STU-TVL	Student Travel
SUPP	Supplies
TR-EQ-MT	Training Equipment Maintenance

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